NEW ORLEANS MEDICAL AND SURGICAL JOURNAL

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ORIGINAL ARTICLES.

(No paper published or to be published in any other medical journal will be accepted for this department. All papers must be in the hands of the Editors on the tenth day of the month preceding that in which they are expected to appear. Reprints may be had at reasonable rates if a WRITTEN order for the same accompany the paper.)

THE X-RAY DIAGNOSIS OF DISEASES OF THE LUNGS.*

By DR. AMEDEE GRANGER, New Orleans, La., Officier d'Academie; Professor of Radiology, Post-Graduate School of Tulane University; Chief of the X-Ray Service of the Charity Hospital.

INTRODUCTION.

A good X-ray film records as shadows of varying densities the amount of absorption of the X-rays by the organ or part through which these rays pass, and if the normal shadow density of the organ or part is known, we must learn to look upon abnormal densities as indicative of definite pathological changes. A radiogram is in fact a faithful shadow picture of gross pathology. In the study of lung pathology, it is superior to other methods because it can be used during the life of the patient to ascertain the character and extent of the lung lesions and to follow their development.

Certain densities suggest definite cellular pathology, but their etiology can only be deduced by a careful study of the entire

*Read before the Louisiana State Medical Society Meeting, April 11 to 12, 1922.

lung field, and then not always without the aid of the clinician and the pathologist. The independent X-ray report has great value from a purely laboratory standpoint, but the real value of the X-ray study of the lungs is when its results are correlated with those obtained from the other clinical methods of investigation. Thus the plate reading should be made without any knowledge of the physical signs and symptoms of the patient and the abnormal densities interpreted in terms of definite pathology. A diagnosis and, with a lesser degree of accuracy, a prognosis can usually be made after correlating the data thus obtained with the physical signs, the history of the patient and, when need be, with the other laboratory findings.

The greatest benefit to be derived from the routine X-ray examinations of the lungs lies in its ability occasionally to yield definite data in the absence of definite physical signs.

The peculiarities in the anatomical structure of the lungs as demonstrated by Miller and Dunham with the relation between the bronchi, arteries, lymphatics, and secondary lobules have such an important bearing on the interpretation of all pulmonary lesions that they will be briefly described.

Normal Lungs.

Normal lung tissue can with accuracy be detected on the X-ray film, and the radiologist should become familiar with its characteristic density and with normal lung markings as well (Fig. 1).

The shadow of each root includes the shadows of the bronchus, the pulmonary artery, two pulmonary veins, one bronchial artery on the right side and two upon the left, one bronchial vein, lymphatics and nodes, nerves, and alveolar tissue, the whole surrounded by pleura. The bronchi are posterior and the pulmonary veins anterior to the pulmonary arteries. On the right side the bronchus is shorter than upon the left and the superior trunk is given off above the level of the pulmonary artery. On the left side, the bronchus is below the level of the pulmonary artery and all the branches are given off below that level. In the lung the root divides into two main trunks, which are a superior one and an inferior one; and in the right side, a third trunk, the median one, which goes to the middle lobe. The superior trunk divides into three branches, which are named according to their location, the vertebral and the first inter-space and second inter-space branches. The inferior trunk divides into

branches, some going anteriorly and others posteriorly. These trunks and their principal branches form the set of larger divisions of the bronchial tree and are situated in the hilum zone of the lung fields. The lungs are divided into many numerous cones or triangular pyramids (the secondary lobules of Miller) by the septa of the lungs. These septa, which are prolongations of the pleura into the lungs, limit the extent of many lung lesions as effectively as the lobe limits lobar-pneumonia.

Dunham has divided the lung fields from the sternum outwards into three zones, called, respectively, the hilum zone, mid zone and peripheral zone. These zones are limited by three imaginary curved lines extending from the clavicle to the diaphragm, and corresponding to the three sets of divisions of the bronchial tree visible on an X-ray film, the larger medium and the smaller or tertiary sets. Three sets of lymph nodes, the proximal, median and distal, are found at the bifurcation of these three sets of bronchial tree divisions, and three sets of secondary lobules, the hilum, median and peripheral, are situated in the corresponding zones of the lung fields.

When a lesion with differentiating density develops within one or a number of these secondary lobules it may be recognized upon the film.

TUBERCULOSIS.

Since, if we exclude acute pneumonic infections of the lung, pulmonary tuberculosis is the most common lesion we find, it must be excluded before any other diagnosis can be substituted.

The earliest recognizable lesion of adult tuberculosis is the Dunham fan, a cone or triangular-shaped shadow with its base towards the periphery or pleura, usually found in the apical region along the first or second interspace branches. It is formed when the inflammatory exudate, at the point of inoculation with the tubercle bacilli, fills the air cells and terminal bronchus of a secondary lobule. The lesion is limited by the lung septa which forms the walls of the lobule, and barring cavitation, does not spread beyond that boundary. When adjacent lobules become invaded it is through the lymph stream or the smaller bronchi and not by continuity. Early fans are usually small and are found, in studying sections of the lung, to be near the pleura. Dunham believes that the presence of two or more of these fans of different densities in the location already mentioned consti-

tute a lesion which is pathognomonic of adult tuberculosis. The varying densities of the fans is due to the difference in their ages and they represent the tuberculous lesions in its various stage of development, exudate, fibrosis, caseation, calcification.

Dunham recommends the following classification of the abnormal densities seen on the radiograms, which is based on the pathology of pulmonary tuberculosis. It has proved of great help to him in making a prognosis and in differentiating tuberculosis from other diseases of the lung:

Adult types (sensitized patient).

Apical tuberculosis.

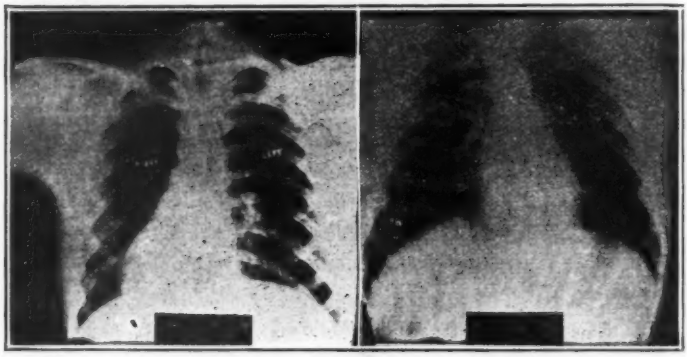

FIG. 1.
NORMAL LUNGS.
Transportation of the Thoracic Viscera.

FIG. 2.
PULMONARY TUBERCULOSIS.
Broncho-Pneumonic condition involving the upper, middle and apex of the lower lobe of the right lung, and the upper lobe of the left lung.

Gelatinous and caseous broncho-pneumonia with apical lesions.

Lobar caseous pneumonia with apical lesions.

Fibrous pleurisy—pleural exudate.

Puerile types (non-sensitized patient).

Primary lesion and tuberculous nodes.

Miliary tuberculosis.

Tuberculous caseous broncho and lobar pneumonia without apical lesions.

Caseous pleurisy.

After the apical lesions the most common lesion of the adult tuberculosis is caseous broncho-pneumonia. As a rule it invades first the upper lobe above the second interspace, then the upper

portion of the lower and median lobes, then the lower part of the upper lobe. (FIG. 2.)

It frequently can be seen scattered along a branch of main stem bronchus suggesting raisins upon a stem. (FIG. 3.) It may become confluent and produce pseudo-lobar caseous pneumonia. Both lungs may be involved but usually not to the same extent. Caseous lobar pneumonia or gelatinous tuberculous lobar pneumonia (hasty consumption) may involve a lung or part of a lung or both lungs. Such lesions break down and cavitate rapidly, forming large thin-walled cavities, the prognosis is desperate. (FIG 4.)

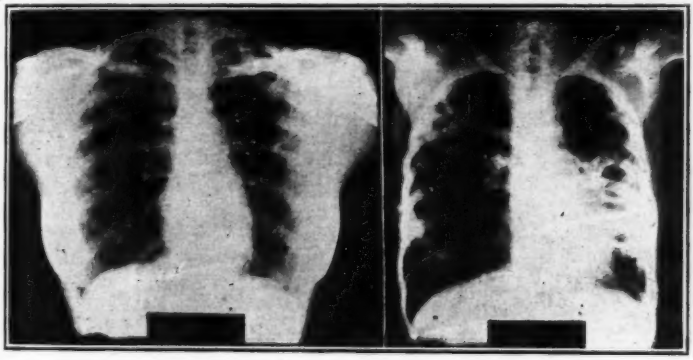

FIG. 3.
PULMONARY TUBERCULOSIS.
Broncho-Pneumonic areas scattered along the branches of the main stem bronchi in the upper lobes of both lungs.

FIG. 4.
PULMONARY TUBERCULOSIS.
Gelatinous tuberculosis lobar pneumonia with rapidly forming large thin-walled cavities in both lungs.

Acute miliary tuberculosis (galloping consumption) presents a picture that is characteristic, resembling fine studdings more or less evenly distributed throughout both lung fields. Without the history and clinical picture such plates could not be differentiated from pneumoconiosis.

Basal tuberculous lesions without apical lesions are rare; when they are seen it is usually in children. They may be pneumonic or broncho-pneumonic in character and must be differentiated from lung abscess and unresolved pneumonia. The clinician must make the final diagnosis, the radiologist can only describe and locate the lesion.

The X-ray picture of caseous pleurisy is that of an empyema associated with caseous broncho-pneumonia.

The necessity of studying the distribution and character of the lesions through all the lobes can not be too strongly emphasized, because, taken alone, the abnormal densities offer nothing characteristic in quality. A single fan is neither characteristic in itself nor pathognomonic of tuberculosis. Any lung infection (influenza) in which an exudate is thrown out may produce a fan for the same anatomical reasons responsible for its production in tuberculosis. But owing to the pathogenesis and spread of the latter, which is known to consist of a series of repeated infec-

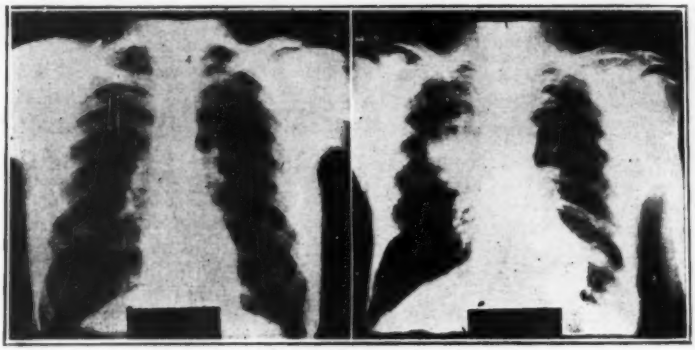

FIG. 5.
LUNG SYPHILIS.
Dense hilum shadow and peri-bronchial densities involving principally the lower lobe of the right lung.

FIG. 6.
LUNG SYPHILIS.
Gummata with peri-bronchial densities.

tions either from without or within, fans of different densities are found. Viewing the lung lesion as a whole, the picture thus formed is characteristic. Generally speaking, it is advisable in the adult to limit the X-ray diagnosis of pulmonary tuberculosis to definite tuberculous lesions of the parenchyma, because we have no way of deciding whether peribronchial and hilar densities are produced by tuberculosis or by some other infection. Dunham believes that they have little clinical significance unless they are accompanied by fans.

Thickened trunks and heavy hilum densities may be valuable in reading the plates of children, but only as a study, not as a final diagnosis. Dunham considers heavy trunks and heavy hilum

shadows containing definite caseous or calcareous areas in children's plates as tuberculous.

SYPHILIS.

Watkins found 172 cases of pulmonary syphilis in 6,500 examinations of the chest and heart, and 209 cases of syphilis complicating advanced tuberculosis. The lesions of active or early syphilis are seen as densities caused by gumma or inflammatory infiltration. The lesions of old, latent or hereditary syphilis are seen as densities caused by interstitial peribronchial or periarterial fibrosis or dense fibrosis of the lung or pleura.

Wide variations of densities from simple peri-bronchial de-

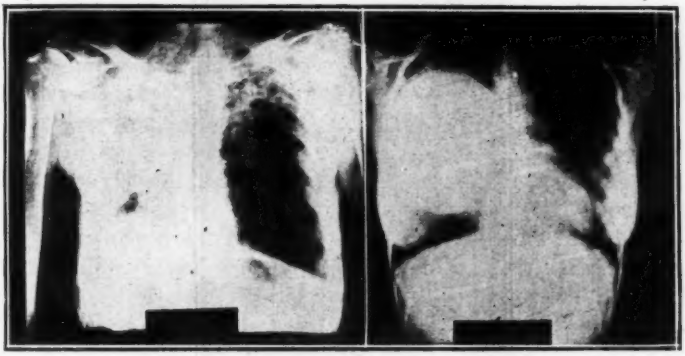

FIG. 7
LUNG SYPHILIS.
Broncho-stenosis with partial collapse of the right lung and marked retraction of the heart and mediastinal structures to the right side, resulting from the syphilitic ulceration of the bronchus. Gummata and peri-bronchial lungs.

FIG. 8.
LARGE ECHINOCOCCUS OF THE RIGHT LUNG.

posits of fibrous tissue in a limited lung area to complete consolidation of an entire lung are produced by lung syphilis.

When active syphilis invades the lung, extensive consolidation or inflammatory infiltration usually takes place in the lower lobe because of the tendency of this infection to follow the larger arterial trunks. The shadows are of varying density, with irregular edges and showing a tendency to form along the heart border and larger bronchial trunks, and the right lung is more often involved than the left. (FIG. 5.)

When the tissue resistance is sufficient to encapsulate the diseased area, gummatous lesions result. The shadows of gummas

vary in size, are usually multiple, are confluent, their edges are slightly irregular, but better defined than consolidated areas. When caseation takes place their centers have diminished densities. When fibrosis takes place, these shadows become irregular in outline with extensions of fibrous tissue which contract the lung and obstruct bronchi.

The interstitial or peri-bronchial fibrosis or arteritis with its end result dense fibrosis of the lung or pleura, occurs in latent syphilis.

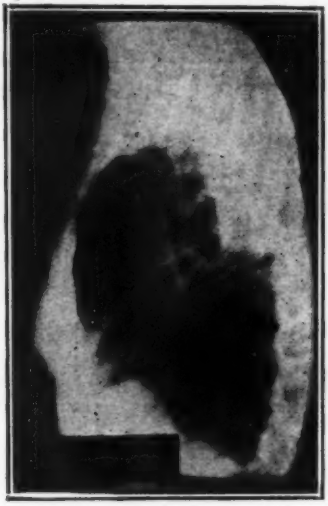

FIG. 9.
LATERAL VIEW OF CHEST.
Showing marked fibrosis and calcification of the tracheobronchial glands and of the main stem lymph nodes with peri-bronchial densities.

This peri-arterial fibrosis causes fine or coarse linear striatious usually springing from a dense hilum shadow and radiating to the periphery. These striatious may occupy a limited area or involve both lungs generally.

Indefinite lung densities are frequently found in association with cardiac or aortic syphilis and although it has never been definitely decided whether they represent inflammatory reaction secondary to infection or passive congestion from mechanical

conditions, the observation has repeatedly been made that they disappear under anti-luetic treatment.

The pleura is also extensively involved and causes a marked connective tissue reaction, resulting in radiating or stellate scars which may be very extensive but which rarely calcify.

The general types of radiographs resulting from the pathological lesions described above are:

1. Gummata with syphilitic peri-bronchial densities (FIG. 6).
2. Syphilitic peri-bronchial densities. (FIG. 5.)
3. Broncho-stenosis with collapse of the lung and marked retraction of the heart and mediastinal structures to one side, resulting from the syphilitic ulceration of a bronchus. (FIG. 7.)

Syphilis and tuberculosis may occur simultaneously in the same lung, each producing its own lesion which frequently can be recognized on the X-ray film.

The two diseases may also occur as a true symbiosis when the characteristics of neither infection will be preserved.

When the syphilitic areas have been invaded by tuberculosis or when the encapsulated tubercle is broken down and the bacilli disseminated under the influence of syphilitic infection, we should not expect to find typical densities. However, the absence of infected cavities, the confluence of small consolidations along the heart border, the hilum masses and the diffuse peri-bronchial fibrosis more marked in the lower lobe should suggest syphilis.

MALIGNANT TUMORS.

Malignant tumors may be sarcoma or carcinoma and primary or secondary. Primary sarcoma is usually in the form of lympho sarcoma and is detected on the film as a large single shadow which may occupy the greater part of the chest. Secondary sarcoma frequently follows malignant sarcoma of bone, tonsils, cervical lymph nodes or of other regions of the body. These tumors spread through the lymphatics as does tuberculosis, are not limited by the lung septa, spreading rapidly by continuity and show no special affinity for the apices. They may be small or large, usually multiple and appear as rounded circumscribed shadows.

Shadows due to metastatic carcinoma are usually fairly regular in outline and are apt to be limited more to the region of the mediastinum although invasion of the lungs is not infrequent.

They not infrequently follow carcinoma of the breast or other parts of the body.

Primary carcinoma are less frequent and usually present an X-ray picture which is quite characteristic. Christie has described two types—the infiltrative and the miliary causing densities which are not sharply circumscribed but have a hazy appearance at the periphery and are surrounded by a zone of congestion which shades off into the lung shadow.

The infiltrative type, which usually has its origin in one of the large bronchi near the hilus, is seen as a roughly circular shadow extending outward from the hilus with projections radiating out into the lung.

There may be in addition a few nodules with the same indistinct edges surrounding the larger shadow or in relation with the bronchial trunks farther toward the periphery.

In the miliary type, nodules or masses of nodules with the characteristic indistinct edges are seen throughout the lungs.

Calcified shadows are not seen in either primary or secondary carcinoma.

If the characteristic appearance and distribution is seen, primary cancer can be suspected, but it is essential in every case to interpret the radiogram in the light of the symptoms, the physical signs and especially the mode of onset and the course of the disease to make a diagnosis.

Cysts.

Echinococcic cysts are very rare and their favorite side is the base of the right lung, occasionally only they involve the mediastinum. (Fig. 8.) Dermoid cysts arise in the mediastinum and vary in size from a walnut to that of a child's head. The small ones remain in the mediastinum while the large ones may extend outward into the pleural cavity. Very rarely they occupy the right base.

In shape cysts are usually spherical but may be flattened when in contact with the diaphragm. The cyst wall may be very thin or quite thick and is invariably adherent to the surrounding structures, most commonly the pleura.

Dermoid cysts in the majority of cases contain cholesterin crystals and may also contain hair, epidermis, cartilage, bone or even teeth. Partial calcification of the cyst wall is not infrequently found.

PNEUMOCONIOSIS.

Jarvis has been able to demonstrate five stages of pathologic lesions in granite cutters, viz.:

1. Increase in hilum width and density, giving evidence of the continued drainage of an irritant through the lymphatics from the periphery to the tracheo-bronchial lymph nodes.

2. Increased width and density of trunk markings, evidence of hyperplasia.

3. The appearance of densities at the branching of the bronchi due to enlarged lymph nodes from inflammatory changes in them.

4. The appearance of fans giving evidence of an accumulation of more irritant at the periphery than the lymphatics draining that particular area can take care of.

5. The appearance of a homogenous haze at the lung periphery giving evidence that the work of draining back to the tracheo-bronchial lymph nodes has become too great and consequently a detour is being made through the pleural lymphatics.

It requires many years of exposure to dust inhalation for the fan densities to form. These fans are larger than those seen in pulmonary tuberculosis, they are triangular in shape with the sides of the triangle formed by distinct linear densities. Their base is towards the periphery and their apex usually formed by a lymph node density, is towards the hilum.

From ten to fifteen years of exposure to the irritant are necessary for the mechanical irritation to produce a lung picture which may be diagnosed as tuberculosis, cancer or post-flu if there existed constitutional symptoms, and from twenty to twenty-five years to produce a lung lesion resembling a broncho-pneumonia and thirty years one resembling a lobar pneumonia.

It seems possible to parallel films of tuberculosis, post-influenza pneumonia, broncho-pneumonia, syphilis, cancer of the lungs with the films of pneumoconiosis, there being an absence of clinical activity in the latter.

The mechanical irritant seemingly produces the same lesions as those produced by bacterial irritation.

Evidence tends to show that the lesions always remain peripheral and the lung reaction to an irritant is evidenced by densities appearing from the hilus outwards.

Actinomycosis.

Actinomycosis usually occurs in the form of a lung abscess and the diagnosis is made bacteriologically.

Technique.

The fluoroscope can in no way compare with the plate or film in detecting slight lesions nor in studying the various densities due to pathological changes in the lungs. Its value lies principally in studying motion. For that reason the movement of the diaphragm, the pulsation of the heart and aorta, the passing of the opaque meal through the oesophagus can be best studied by the fluoroscope.

The writer's technique consists in making two 14 x 17 films, one a posterior-anterior view, the other a left lateral view of the patient in the erect posture at a target-plate distance of six to seven feet, using a diaphragm opening just large enough to allow the rays to reach every portion of the film. This last condition he considers very important and he attributes mainly to it the great brilliancy of the negatives, the wealth of detail, the good definition of the lung markings and of the abnormal densities when these exist, and the distinct perspective amounting to a very satisfactory pseudo-stereoscopic view. This is well brought out when these films are viewed from a distance of six feet or more or when at closer range for the better study of the minute details they are viewed through a reducing lens of large size placed in the bottom of a dark chamber (a discarded hand fluoroscope hood does very well for this purpose). This dark chamber or hood is not a necessity, but it greatly improves the view of the reduced image by shutting out light and other images. Those who have not examined such films in the manner described will be astonished to see with what clearness and sharpness the minutest details are brought out, and the distinct stereoscopic value thus obtained.

The writer is fully aware of the difficulty of accurately focusing a tube at that long distance when such a small diaphragm opening is used, but he knows also that this purely mechanical difficulty can be overcome so successfully that the focusing becomes almost automatic. This is the case in both his private and hospital laboratories, where six-foot radiographs of the chest have become the routine in all examinations made of the lungs. The superior advantage of this technique was very well illus-

trated in the case of the echinococcic cyst (FIG. 8) to be seen in the writer's exhibit at this meeting.

The rounded shadow of the cyst can be plainly seen, the mammary gland shadow is easily differentiated and the shadow of the diaphragm is distinctly outlined below the lower border of the shadow of the cyst and separated from it by an area of normal lung density, all so clearly seen that even a beginner could not fail to diagnose a cyst. Yet this patient had been examined with the X-rays and her condition diagnosed as one of pleural effusion. The other examination was made with the patient in the recumbent posture and at the usual target-plate distance—26 to 31 inches—and it can be readily seen how the shadows of the various structures, cyst, mammary gland, diaphragm magnified by the shorter target-plate distance, and with the sharpness and definition of their outlines lost, became blended one with the other, causing a reading of the radiogram which did not correspond to the real lung pathology.

The greatest advantage of this long focus technique lies in the fact that it causes such a negligible magnification of the shadows (not more than 5 mm. per 15 cm.) that the measurements of thoracic organs, structures or lesions can, for all practical purposes, be considered the same as those made of their shadows seen on the films. Furthermore, as other films made under identical conditions—position, distance, time of exposure, etc.—can be very easily made as often as necessary the progress of pathological lesions in the lungs can be accurately studied and followed. The great value of this study not only in diagnosis but in prognosis is readily appreciated.

The lateral view is not merely supplementary, but is quite indispensable for the accurate study of the size and location of deep-seated abscesses, interlobar or encysted collections of fluid or pus, abnormal massive densities in the lungs or hilum region, the post-mediastinal space, and the tracheo-bronchial glands. (FIG. 9.) In children, tuberculosis of the tracheo-bronchial glands is not infrequently the only tuberculous lesion present and a true idea of the size and pathology of these glands can not be arrived at from a study of the posterior-anterior film.

NOTE.

Ladies and gentlemen, I have with me a large reducing lens and if any of you desire viewing through it the radiograms illus-

trating several of the pathological lesions described in this paper, I will be delighted to meet you in the scientific exhibit where these films are on display—after this session is over.

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DISCUSSION.

Dr. L. A. Fortier, New Orleans: I want to congratulate Dr. Granger on his complete paper. Besides examination of the lungs this is a great help in heart and aorta conditions. This gives you the true size of the aorta. Before the time of these long-distance radiograms cases were examined by means of the ortho diagrams. Now, with this technique we do not have to expose the patient to the use of so much fluoroscopic observation. Besides the lesions shown here I think the lung examination is important in empyema conditions, either a general empyema localized or a lung abscess. Metastatic lung conditions show up many times when they are not suspected. Cases of gastric carcinoma or carcinoma of the breast, I am sure, many times were subjected to operation when they had metastatic nodules in the lungs already. Therefore, I think radiological work is very important in chest examinations.

Dr. A. Henriques: I want to stress one point: For ten or twelve years some of us had to endure a good deal of adverse criticism for advocating the use of the X-ray in pulmonary tuberculosis. I want to call the attention of those gentlemen who criticized us to Lawrason Brown's recent article on tuberculosis, in which he says that if anyone had told him twenty years ago that his chiefs, Trudeau and Osler, would not be able to discover cases of pulmonary tuberculosis by physical signs alone he would not have believed it, but since the advent of the X-ray he finds this is the case. I want to stress that point to show that the X-ray has come to be recognized as a means of diagnosis in obscure chest conditions in connection with all physical signs.

Dr. S. C. Barrow, Shreveport: This paper must be read and reread to get the real essence out of it. I want to touch on one point and that is the correlation between the X-ray findings and the clinical findings. This old dispute that has gone on for years as to whether the radiologist should give his readings in terms of disease and pathology or in terms of shadows, is a question that is not settled yet. The point I want to emphasize is that it has been my experience

that if the clinicians were to perfect their technique of interpreting their physical findings there would be no more argument between the radiologist and the clinician. My experience is that when we get up against a man who does not know the difference between the various percussion notes, etc., then we have the biggest argument. If a man knows what a rale, etc., means, ninety-nine times out of a hundred his findings will tally with ours.

EYES AND ENDOCRINES.*

By CHAS. A. BAHN, M.D., New Orleans; Professor Ophthalmology, Graduate School of Medicine, Tulane University.

The endocrines are the several organs which, though without definite duct channels, apparently act as glands, modifying in a more or less marked degree the function of other parts of the body. Of these organs, which probably have an internal secretion, the best known are the thyroid, parathyroid, thymus, pituitary, adrenal, ovary and testis.

The eye is seemingly influenced in certain forms of endocrin disfunction through decreased resistance and immunity, trophic, or pigment changes of its component parts, or by increased fatigue. This interesting relationship affords a fertile field for intelligent investigation, and a plausible explanation of many ophthalmic problems, developmental, pathological and therapeutic. The analogy is in a great measure based on the various interpretations which have been placed on a large number of more or less accurate clinical observations, experiments with the lower animals, and on a few definitely proven therapeutic and other facts.

We must not let our enthusiasm for or against the subject lead us into fanciful conclusions which interpret the generally accepted facts as we would wish them rather than as they probably are. Depending on the opinions which various authors have placed on observations, experiments, and accepted facts, the extensive literature on the subject may be classed as ultra-conservative, conservative, and liberal or somewhat imaginative, in which material motives occasionally seem an influencing factor.

With the exception of adrenalin, thyroidin and pituitrin, the active principles of these organs have not been isolated, their chemical composition, properties, physiologic action, indications and dosage are not definitely known and they have not been generally accepted in the opthalmic armamentarium. Unfortunately,

*Read before the Louisiana State Medical Society Meeting, April 11 to 13, 1922.

it is not known that all of the various endocrin preparations are assimilated as administered and retain their activity when given in therapeutic form.

The interrelationship which must exist between the several endocrin organs, although not definitely proven, is a most interesting subject. Generally speaking, disturbances of practically every ductless gland seem to affect all others to a more or less marked degree; as illustrated in the hypophyseal, thyroid and other manifestations associated with menstruation, which can probably be considered as largely influenced by endocrin function.

The belief that each endocrin organ is either a stimulator or depressor of every other ductless gland, and that our physical, moral and mental qualities are but a reflection of our several endocrin functions opens a wonderful speculative field, which to the less imaginative, seems rather in the realm of fancy than fact.

The basis of specific endocrin medication is broadly the administration of the active principles normally furnished by the defective gland by means of animal gland preparations, or the administration of other gland preparations than that involved, with the expectation that the animal gland preparation will influence the deficient, disturbed, or overactive gland, indirectly through the other glands, causing the endocrin mechanism to right itself and function normally.

Investigation is needed to clarify accurate endocrin diagnosis, which at present is largely based on the resemblances that the patient may show to our somewhat incomplete conceptions of the various clinical pictures associated with ductless gland disfunction. Therapeutic diagnostic measures, as now used in hypothyroidism, etc., have future possibilities, though in objective tests such as the estimation of basal metabolism, etc., future advances seem more probable.

The Thyroid.

By increased normal function the thyroid affects the metabolic processes, cardiac activity, the sympathetic nervous system, and the function of other organs, especially the thymus, hypophysis and ovary.

In cretanism and thyroidectomized young humans and animals, mental and physical underdevelopment occurs, while in the more mature, certain metabolic changes predominate. Of these,

the more frequent are impairment of appetite and nutrition, emaciation, mental apathy, premature senility, and trophic ectodermal conditions such as falling of the hair, dryness and pigment changes of the skin, and inflammations which clinically resemble eczema.

Falling of the brows and lashes, eczematous lid inflammations, deep keratitis, certain types of cataract, uveitis, optic neuritis, and retinitis pigmentosa are the most frequent ocular conditions associated in the literature with hypothyroidism.

The favorable progress reported by some, absence of results, and unfavorable symptoms reported by others following thyroid administration show that the characteristics of these conditions specifically caused by endocrin disfunction are not understood and that more knowledge is necessary before thyroid treatment can be generally accepted at least in most of the conditions mentioned.

Rather interesting in this connection is the assumption that the action of the so-called alteratives, such as the iodides, etc., is essentially endocrin, which perhaps explains their favorable action in non-bacterial diseases and in the old, where glandular function is diminished.

Although clinical evidence suggests that the thyroid plays an important role, it is not known that defective immunity and resistance results from a specific dis or hypo endocrin function, rather than as a part of a general malnutrition in which the ductless glands also participate. Only a small proportion of those afflicted with congenital lues have interstitial keratitis, which is essentially an ocular manifestation, differing, however, in its course and resistance to treatment, from the usual leutic processes elsewhere in the body. The clinical resemblance of congenital lues to hypothyroidism and the excellent results reported following thyroid administration in certain cases of interstitial keratitis, have lead to the assumption that this corneal condition is essentially a uveal reaction to luetic toxines in persons sensitized by hypothyroidism.

Another class of ocular conditions, of which herpes and the dystrophies are the best known examples, are characterized by an apparent lack of vitality of the tissue, usually associated with anesthesia. The injection of alcohol into the nerve ganglia such as the Gasserian, produces a somewhat similar clinical entity,

it is believed, by destruction of the sympathetic nervous supply to the part involved. The pathological process in neither condition resembles that seen in the usual inflammations from other causes.

HYPERTHYROIDISM.

Graves' disease is essentially a hyperthyroidism, much more frequent in females and during the menstrual years; whose most common evidences are tachycardia, exophthalmus, tremor, thyroid enlargement, pulsation of the larger vessels, anemia, emaciation, flushes profuse perspiration, pigment changes in the skin, etc. These have been attributed to basic changes in the sympathetic nervous system because experimental stimulation produces a somewhat similar clinical picture.

The most frequent ocular manifestations are:

1. Protrusion of the eyes with widening of the palpebral opening (Dalrymple's sign), usually bi-lateral and varying from the slighest perceptible degree to that which prevents lid closure and causes ulceration from ocular exposure. This has been variously attributed to over-stimulation of the unstriped muscle tissue in the orbit and to vaso-dilatation, similar to the pulsation of the large vessels in the neck but modified by the inelastic boundaries of the orbit.
2. Decreased and imperfect winking (Stellwag's sign).
3. Defective convergence (Moebius' sign).
4. Inability of the lid to follow the eyeball down (Graefe's sign).
5. Tremor of the upper lid (Rosenbach's sign).
6. Difficulty in everting the upper lid (Gifford's sign).
7. Inequality of the pupils.
8. Increased retinal vascular pulsation.

These, too, have been attributed to sympathetic nerve disturbance.

Specific endocrin medication, including Rodagen and other preparation of thyrodectomized animals, has not apparently met with the expectations of its former advocates. X-ray, radium and surgery are the most approved methods of treatment.

PARATHYROID.

Tetany and certain changes in the teeth, lens and other ectodermal tissues follow removal of the parathyroid. It has been assumed that these small glands play a more or less important

role in the development and nutrition of certain ectodermal tissues which show developmental defects resembling the clinical picture seen after parathyroid extirpation.

Among the most frequent is zonular cataract, which is most often seen associated with bad teeth and a history of childhood convulsions, and is characterized by perinuclear opacity, suggestive of a cause of very limited duration.

THE PITUITARY.

The association of the anterior lobe with skeletal, mental and sexual function and development; and the intermediate lobe, with sugar metabolism, is generally accepted.

The ocular manifestations of anterior hyper or dis pituitarism are usually those of pressure on the optic nerve at the anterior chiasm, rather than the result of interval secretion, although bitemporal hemianopsia is not the only field defect which has been observed. The closer proximity of the crossed fibres in the chiasm to the enlarged pituitary frequently results in pressure and degenerative changes in the nasal optic nerve and retina. The extra ocular paralyses, varying field defects, and amblyopias which have been described in patients with pituitary disease, are variously ascribed to increased intracranial pressure, local pressure from the enlarged pituitary and toxemia resulting from disturbed secretion.

It is possible that at least some of the objective findings mentioned are due to the reaction of one or more of the ocular tissues to degenerative products produced in the gradual death of the tissues which are affected by chiasmal pressure.

The relationship between diabetic ocular affections and general conditions resulting from intermediate lobe disfunction is not well established.

Pituitary preparations obtained from the anterior, intermediate, or both lobes seem to have but little effect upon the course of the ocular manifestations of pituitary disease, possibly, because they are the result of pressure and hyper, rather than hypo pituitary function. Surgery, X-ray and radium are the most approved modes of treatment.

THYMUS.

Children with general glandular enlargement, leucocytosis, increased fat deposit, under-development of the heart and aorta, and enlarged thymus have a marked susceptibility to bacterial

infection and increased liability to sudden death from apparently insignificant causes.

Aside from the increased danger of these children to sudden death during narcosis, there does not appear to be any direct relation between the thymus and the eye.

The Adrenals.

Certain types of glandular disfunction, as in Addison's disease, are closely associated with muscular weakness, gastrointestinal disturbances, and changes of pigmentation.

Aside from the pigment changes in the lids comparatively little has been clinically proven concerning the relationship which exists between adrenal disfunction and ocular disease, although pigment disturbances in the iris, uveal tract, and retina; glaucoma; and increased ocular fatigue have been mentioned in this connection.

Increased fatigue whether in the eye or elsewhere is one of the dominant symptoms associated with endocrin disfunction, as it is also, of most local and constitutional affectations; hence it is apparently over-stepping the bounds of probability to assume that glandular disturbance is a cause of major importance.

The use of adrenalin is practically limited to surgical and diagnostic purposes. Its indiscriminate use in temporarily lessening the injection accompanying various ocular inflammations is to be strongly condemned as it has no curative properties and a momentary cosmetic benefit derived by the blanching of the ocular tissues is more than counter-balanced by the secondary vaso-dilitation which inevitably follows and which may become permanent following continued use.

The Ovary.

Aside from the retinal changes associated with the albuminuria of pregnancy and perhaps the rare ocular manifestations attributed to vicarious menstruation, our knowledge concerning any direct relation between the eye and the ovary is more or less conjectural.

Favorable results have been reported in a few cases following the administration of ovarian preparations in various ocular fatigue symptoms, especially during the climateric adjustment. Whether or not they were the direct results of the treatment cannot be determined.

OTHER ENDOCRIN ORGANS.

Among the other organs to which have been attributed an endocrin function are the spleen, liver, pineal body, faucial and pharyngeal tonsils, testicles, prostate, etc.

So little is known concerning their specific functions from an endocrin standpoint or any relationship that may exist between this function and the eye, that more than passing mention hardly seems justified.

CONCLUSION.

The purpose of this contribution has been a simple and sane presentation of one branch of this interesting subject in its present evolution, for the general physician. At this time, its value lies more in a better understanding of the patient and the ailment than as a means of indiscriminate therapy based either on hypothetical deductions of unproven facts or as an excuse for inefficient examination and diagnosis.

Much intelligent investigation, accurate observation and prolonged study of endocrin function and disfunction is needed before the ductless glands can take their proper place in medical science.

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TREATMENT OF PYELONEPHRITIS BY PELVIC LAVAGE.*

By Dr. M. H. FOSTER, Alexandria, La.

I. Introduction.

The scope of this paper will be limited to the consideration of the inflammations of the renal pelvis with their associated kidney involvement exclusive of trauma, tuberculosis, and the results of back pressure from urethral strictures, and prostatic enlargements. Probably the most readable and comprehensive contribution to the medical literature of recent years has been made upon this subject by Frank Kidd, of London, and we hereby acknowledge this authority for numerous quotations made use of in this paper.

It has been stated that the profession is not sufficiently informed concerning pyelitis, and that cases of infected pelvis remain in the different departments of our large hospitals as unexplained causes of pyrhexia. That this should seem to be true is unfortunate, for nothing responds more rapidly to suitable treatment.

From my acquaintance with them I believe that the thinking members of the Louisiana State Medical Society are alive to the importance of pyelonephritis, and I know several urologists in our own state whose management of the kidney infections ranks their services with our best—foreign as well as domestic.

During the less than three years since my return from the army to develop a urological service in Alexandria, I have been deeply gratified by the co-operation of the hospitals here, and by the sustained encouragement of the medical profession, both of Alexandria and from our neighboring communities, and I believe this is an appropriate occasion to publicly thank my confreres for their interest and support.

The average human kidney is made up of ten to twenty lobes containing in the aggregate one-half of a million glomerular capsules, and fifteen miles of urinary tubing. It is not so much of a wonder, then, that we sometimes have pipe troubles, but rather that we even succeed in keeping up the plumbing at all!

Considered from several standpoints, the renal organ is truly a marvelous mechanism. By way of comparative anatomy we note that the crustacean possesses a fused cephalothoracic cavity

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almost entirely filled by a pair of renal organs. He is an aggressive scavenger and needs a large filter plant!

By way of evolution, we find lower vertebrates with compound racemose renal glands—many lobes hung more or less loosely together as a bunch of grapes. And in human embryology we have an emunctory appliance which presents striking variations as to number, location, and as to the source and distribution of its blood supply.

While we commonly recall that the testicle descends from the pelvis to the scrotum during fetal life, we should also bear in mind that during the same period the kidney is undergoing differentiation and migration to a home on higher ground, and that it fails to establish itself in a normal location more often than does the testicle.

Dr. Rand has just referred a case in which the ureters are unusually short, both kidneys dystopic, and there appears a kink at the ureteropelvic junction which may be due to a low-lying left renal artery producing a so-called sanitary trap obstruction to free drainage, and resulting in chronic pyelitis.

II. Etiology.

But all these embryologic and anatomic factors are but adventitious influences in effecting pyelitis. The direct causes are stasis and infection, and the bulk of evidence is in favor of the conclusion that they work together. It has been repeatedly proven that under normal conditions germs are filtered from blood to urine without causing damage to the kidneys, but if the ureter becomes obstructed, pyelitis will result. While the kidney of pregnancy is the most widely recognized, yet it is not clearly understood by all medical men. We hasten to agree with Cabot that, pathologically, it is not a distinct type, but is the result of renal stasis from a mechanical condition, *i. e.*, pressure from the gravid uterus after it rises out of the pelvis and rotates toward the right, therefore it is usually seen between the fifth and the eighth month and is commonly a right-sided pyelonephritis.

Again, if an overwhelming amount of infection be suddenly fed into the blood, the filter plant will become clogged and pyelonephritis follows. That there is a direct lymphatic connection between colon and kidney is no longer doubted, and Japanese investigators claim to have traced lymph radicles from the capsule down through the cortex into the medulary substance. Asch has

produced pyelonephritis in dogs experimentally by feeding them a sufficient amount of opium to maintain colonic stasis. Kidd says that the typhoid bacillus exhibits a penchant for the spleen, but the colon bacillus exhibits a marked preference for the kidney. Granville McGowan, of Los Angeles, says that colon bacillus infection of the kidney, persistent and unyielding to treatment, is invariably due to colonic stasis of the fecal current, and that the interruption is usually in the cecum being immobilized by adhesions. Fluoroscopic examinations have corroborated this condition in our own service. Other organisms which may produce pyelitis, are the staphylococcus, streptococcus, more rarely the proteus vulgaris, and occasionally the gonococcus. In 1911 Caulk, of St. Louis, called attention to the characteristic incrustations in the bladder following proteus pyelitis and also to his treatment with bulgara bacillus. I have seen this type of infection while working in Caulk's service at the Barnes Hospital, and also treated a case here last year, which was referred by Dr. Antony.

III. Symptoms.

Pyelonephritis is encountered as both acute and chronic. The typical acute case may come on in an individual who is quite healthy and active, by sudden and severe bladder irritability. There will be frequency, urgency, dysuria, and sometimes hematuria. English writers use the word "Strangury," and Kidd says that while strangury in the male may mean posterior urethritis, in the female it is nearly always due to pyelitis. "Bladder symptoms are common in appendicitis, for pyelitis secondary to appendicitis is common, and because pyelitis has been wrongly diagnosed as appendicitis."

Then there is another class of cases more numerous and severe than the preceding group, in which pyelonephritis of a fulminating character will occur as an intercurrent infection in addition to a previously existing malady, and immediately assume a position of prime importance and gravity. The prodromal lesion may have been one of the acute systemic infections, more rarely a chronic pus infection, or what I especially wish to emphasize by a synopsis of case histories a little later, as a metastatic pyelitis after abortion, miscarriage, and labor. Here there is a sudden chill, high fever, pain in the region of the back and pubis, gastro-intestinal disturbance, and leukocytosis as high as 90%

or more. Dr. Foster Johns insists that in pure colon bacillus infection of the kidney leukocytosis is not the rule, even though ureter blockage may follow pus formation. They may not all have chills, but when they do they are sick folks. There will be a marked tenderness to fist percussion over one or both loins according to involvement.

There is also a class of chronic pyelonephritics which, like the poor, we have with us always. As a class they present no constant set of subjective symptoms. They may be symptomless for months and years. Others may present acute exacerbations with surprising regularity or periodicity. Some of these will be treated for malaria, and some for tuberculosis (according to the preference of the doctor), while others will find their way to the spiritual or mechanical healers. But their story can always, and only, be told by the cystoscope, ureteric catheter and microscope, in the order named.

IV. Diagnosis.

There can be no pyelonephritis without pus in the urine. Its occurrence and quantity may vary, but its presence never. At the onset of a fulminating attack pus may not be present in the voided urine because of a blocked ureter, but wait until a little later, or catheterize the ureter and you will get urine that is rank and rotten. With some experience to the contrary, I am unable to accept the statement ascribed to Crabtree, of the Massachusetts General Hospital, that colon bacillus infection of the kidney though frequently resulting in pus formation in the dog, does not do so in man. Red blood cells alone in the catheterized urine are conclusive of nothing, casts are not found without tubular involvement, and it is fatally easy to detect a little albumin in the urine and condemn somebody to a kidney diet, early death, and no insurance. Therefore the urine should be studied first as the gross voided specimen, then cystoscopic inspection of the bladder should be made for evidence of ureteral involvement, and the ureters catheterized for purposes of differential diagnostication and treatment. Urine thus obtained should be microscopically studied under both the high dry, and the low power objective, in slide suspension, and stained film preparations. Mercurochrome 1½% for ½ min. has recently come into use among urologists for this purpose. Occasionally I want a urine cultured, but as I have previously pointed out, bacteria are be-

ing filtered through the healthy kidney with frequency, and cultures may therefore be misleading.

Malar, of the London Hospital, in cultures of the blood to prove the hematogenous transmission of the infection from a distant focus to the kidney has obtained indifferent results, because of the rapidity with which the organisms of a given invasion pass out of the blood stream. But Crabtree, of Boston, claims positive results in 30% of his cultures only when blood is taken during the chill.

All of the above groups are apt to show no marked diminution in the renal function either in the time of appearance after injection of Phloridzin, or in the phthalein output. This is in marked contract to another group which I have christened the "Back-water or Pressure Pyelonephritics," produced by chronic urethral stricture and prostatic enlargement, the prostatics showing the greatest diminution of function and the urethral strictures a relatively moderate amount.

V. Treatment.

Nearly half of the cases get well spontaneously, but the remaining 60% should be classified according to their requirements as medical, surgical and urological. In the acute cases that will respond promptly we prefer to withhold instrumentation until their activity subsides. They are put to bed with free catharsis, and the tissues are copiously washed free of the toxins with five or six pints of fluid daily Potassium citrate in 40- to 60-grain doses is given with sufficient frequency to make the urine alkalin and then keep it so. In cases where the stomach tires of this the following will be found more acceptable: Potassium citrate 30 grains, magnesium citrate, and magnesium carbonate each 20 grains, potassium bicarbonate 10 grains.

After eight or ten days on the alkaline treatment we give them a day's rest off of treatment if the temperature is normal and begin hexamethylin with acid sodium phosphate, for it must be remembered that it is useless to give urotropin without a urinary acidifying agent.

Under the leadership of Kidd in England and McGowan in this country, it is now becoming the vogue to do meso-colonic shortening in the cases of chronic B. Coli infection from fecal stasis due to visceroptosis. We urologists admit that these are intractable cases, and that we fail to clear colon bacilli from their

pelves and keep them clear even after years of effort in some, nevertheless the writer entertains the hope that he will not be considered reactionary if he requires some proof of our surgical brethren that the ptotic colon will remain hung and continue to function efficiently after they have attached it to higher pegs. The cases above have been under observation for but a few years at most and we have not fallen headlong for the most radical plan. In cases where the fluoroscope shows that the colon is not yet immobilized by adhesions, or where improvement results from its use, we first apply an abdominal support properly fitted to the individual wearer, and then if this fails of relief we can resort to surgical measures with a clear conscience, confident that no one has been done an injustice.

"That chronic pyelonephritis is often cured by pelvic lavage deserves to be widely known, for I believe that at the present time it is the only cure for the chronic cases." It has been some 35 years now since Pawlonic, of Vienna, and Howard Kelly, on this side, passed a catheter into the ureter for the first time, and it was in 1906 when Voelcker, of Heidelberg, accidentally obtained a leakage of collargol up into a ureter while doing a cystogram. In 1911 Koll, of New York, advised the treatment of pyelitis by the instillation of aluminum acetate, and in the same year my former master, Caulk, of St. Louis, brought out his treatment of pyelonephritis produced by proteus vulgaris with cultures of bulgara bacillus introduced through the ureter catheter. Since then the progress of lavage has been extensive, and its results are often dramatic, until the time came when it seemed desirable to check up the various agents in use for instilling into the pelvis with a view of ascertaining, if possible, their relative efficiency. This was done last year by O'Connor in a series of 30 dogs. They were injected with the various drugs, in some instances the ureter being ligated to insure continued and maximum effect, then the dogs were killed on stated intervals, and the region of the pelvis studied in each case serially. Mercurochrome was found to penetrate entirely to the renal cortex, and evidence of its presence remained longer than any other drug. Silver nitrate was found to entirely destroy the mucus membrane, with complete exfoliation of the pelvic and calyx lining after using the stronger solutions (5%), but this was perfectly regenerated in the dogs killed two weeks after treatment.

O'Conner's conclusions were not positive for the definite superiority of any one drug, but his impressions have been largely concurred in, in that the best results appear to follow the use of several drugs alternately. For this reason I often inject a heavily infected kidney at the start with silver nitrate 1.500 to 1.100, and at the next treatment may select either mercurochrome 1% to 2%, or sylvol 10%. Acriflavine, argyrol, etc., may also be used, but it seems rational to reserve the astringents (zinc and aluminum) until after control of the active infection, just as we do in urethritis. Lavages should be repeated at intervals of five to ten days, or more in the chronic cases, but for reasons stated above silver nitrate, at least in the stronger solutions, should not be repeated under two weeks. In the presence of obstruction or virulence, the catheters may remain in the ureters for one to four days, and the pelves repeatedly irrigated at convenient intervals as desired.

Finally, it is desirable that the referring physician remind our mutual patients that they are neither slot machines nor boiler iron and therefore complete repair cannot result from the first treatment, but that the urologist will care for them gently, and with due regard for their tolerance and safety.

DISCUSSION.

Dr. H. W. E. Walther, New Orleans: This paper was intended for the edification of the general practitioner. The essayist did not intend to leave the impression that every case of pyelonephritis requires pelvic lavage for cure. He stated that many of them got well without cystoscopic therapy. That is where you use your usual urinary antiseptics combined with forced water drinking, with rest and eliminative treatment. But where you are dealing with obstruction to the outflow of urine from the kidney pelvis, where there is stasis in the kidney pelvis, the case will not be relieved by medicinal measures and cystoscopic therapy will be necessary.

There is no question about focal infections playing a large role in these cases. I think about 90 per cent are due to the colon bacillus. The colon bacillus is often in other places besides the kidney—either in the bowel, the teeth, the tonsils, or the prostate. If these other foci are not cleared up you will have a hopeless job attacking the kidney alone.

There is no doubt of females being more prone to these troubles than males. Of course we must have a catheterized specimen of urine from females. I brought out before the society two or three years ago the necessity of catheterizing females in studying their urine.

These cases cannot be cured with one or two lavages. It requires time to cure these cases. Albumin is always present in the urine where you have pus, blood or bacteria; you cannot tell what the albumin is due to until you rule them out. I do not believe in culturing urine. Fresh centrifugalized specimens stained are much more valuable than cultures.

I want to emphasize the value of pyelograms in cases of obstruction. You may think you have a simple pyelonephritis when in fact you are dealing with some ureteral abnormality and there the pyelogram is of the utmost value.

Catheters can be left in kidneys twenty-four hours or longer for purposes of continuous drainage.

A new internal urinary antiseptic is acriflavine. It is better than urotropin. Give 0.46 grains doses by the mouth, t. i. d. Use a refined product that will not irritate the stomach and gastro-intestinal tract.

I believe the new plan used by many urologists of washing out the kidney with mercurochrome at one sitting and then alternating with silver nitrate solution at another sitting is the ideal method of local treatment.

Dr. M. H. Foster, closing: In reference to Dr. Cather, it will be recalled that I just made the statement that 40% of the common kidney pelvis infections tend to spontaneous recovery. His chances are just six against four that a sudden exaccerbation at any time will send him to the urologist with an urgent plea for active treatment abruptly and with precision. It is very interesting to note that this is what actually occurred six days later.

Now, I wish to add a brief synopsis of three cases of pyelitis by metastasis from another focus of infection in the body.

Case 1 (Referred to by Dr. Gremillion): White female, 36, married. Diagnosis, appendicitis. Urine very cloudy and offensive, pus and albumin found. No. 6 catheter introduced to pelvis of both kidneys. On the left clear urine came out with normal rythm, catheter withdrawn. As no flow occurred from right catheter it was left in place over 24 hours and drainage later established by suction. The urine was thick and offensive, and appeared to be more pus than urine. Treatment: lavage with 10% Sylvol four times. Result: Patient claims more comfort than she has experienced in several weeks. (Comment: Operation revealed a retroperitoneal chronic obliterated appendix. The first diagnosis was correct, but present acute symptoms caused by secondary focal infection. Pyelitis with appendicitis is rather common.)

Case 2 (Referred to by Dr. Peters): White female, 23, married. Diagnosis, pyelonephritis. Malignant malaria last November, abortion, sepsis. This woman was emaciated and desperately ill in spite of all that was done by skillful management as a medical case. Cystoscope revealed inflamed bladder, swollen and pouting meati, urine cloudy, showed pus, and cultured pure B. Coli from both sides. Treatment: lavage 6 to 14 days apart, alternating 2% Mercurochrome, ½% Silver Nitrate, and 10% Sylvol, six times. Result: temperature dropped within an hour after first lavage, and did not again return except on brief periods and for explainable cause (colonic stasis, and house robbed one night), average gain in weight five pounds per treatment. Total gain more than 30 pounds. (Comment: Violent constitutional infection complicated by abortion, operation and opiates necessary. Retention of urine during several days, catheterized as required. Positively no blame on competent nurse with sterile catheter. Kidneys with impaired drainage must inevitably succumb to violent and prolonged bacteremia.)

Case 3 (Personal): White female, 21, married. Diagnosis, abdominal tumor. Thirteen-pound ovarian tumor removed by Batchelor, 1914, fourteen-pound cyst removed by us, February, 1922, abortion five days later, followed by mild sepsis. Leukoctyosis, pyuria. Treatment: Alkalies, and diet until subsidence of acute symptoms. Cystoscoped. Bladder normal. Left meatus pouting and slightly dilated, pelvis capacity about 20 cc. P. S. T. 30% first hour. Right meatus edematous and widely dilated, pelvis held over 40 cc. com-

fortably. P. S. T. 4%, 1 hour. (Comment: Continuous pressure from large abdominal tumors, most of her life practically destroyed right kidney. Pyelitis, bilateral, hematogenous, following abortion. Infection cured by pelvic lavage, function not increased. Infusoria, both paramecia and vorticella type, found in urine. Significance unexplained.)

ORBITAL ABSCESS.*

By JOHN L. SCALES, M.D., Shreveport, La.

When I selected the title of this paper some months ago, more or less haphazardly, I had in mind a group of cases that had proved interesting to me, and I jumped to the conclusion that they might be of general interest; but review of the literature of the past year available to me has raised a doubt in my mind, because I have been able to find only one paper on any phase of the subject, and I have concluded that such cases are so common as to attract little attention, or are rarer than I had thought.

For the purpose of this paper, the term Orbital Abscess, or more properly speaking, orbital suppuration, is not intended to describe any definite surgical or medical entity, but to include all those suppurative conditions found in the orbit, external to the globe itself.

It is generally conceded, I believe, that such conditions as I have in mind are due either to extension by:

Continuity of tissue; the lymphatic system; the circulatory system.

Antecedent infection in the nose or one or more of the nasal accessory sinuses is the probable starting point in most cases, the Ethmoid, Frontal, Sphenoid and Maxillary sinuses being most likely to be found responsible in the order named.

There is undoubtedly a certain number, and I am inclined to think it is not inconsiderable, in which the source of infection can not be definitely determined.

Where there is a direct transmission through infected tissue, as for instance the bone between the ethmoid or frontal cells and the orvital cavity has broken down, there can be no question of the avenue of approach; where there is infection in the adjacent cells but no appreciable avenue of communication, there is room for debate. I have seen it recently suggested and apparently proven by study of microscopical sections that the

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transmission of infection in such cases is by phlebitis of the veins communicating between the nose and the orbit; which would seem reasonable enough.

There are some cases in which it is as difficult to say why the orbit is invaded, as to say why any abscess elsewhere on the body should select its particular site.

I shall report briefly several cases illustrating some of the types classified above, and also show the difference between the acute and chronic types: I shall not touch on the subject of differential diagnosis, assuming that this more or less troublesome question had been settled satisfactorily in advance:

1. Ernest P., col. male, aged about 25, presented himself with a large fluctuating mass at the inner border of the left orbit, which had displaced the eye to some extent, but had not seriously impaired the function; he stated that the condition had existed for a number of weeks, and because of the chronicity, doubtless, there were no evidences of acute inflammation: he further stated that at times the mass would decrease in size, at which times there would be discharge from the left nostril—it apparently did not require a Sherlock Holmes to say that this particular case originated in the ethmoid cells. A free incision showed, however, that it began in the frontal, the whole floor of which had been destroyed, as well as all the bone intervening between that and the ethmoid. A large abscess enclosed in a thick pyogenic membrane had eroded the bone so that what had been the frontal sinus and its bony passage into the nose, together with the ethmoid cells, had been converted into one large smooth cavity. A thorough curetting with a free drainage through and through cured this case, and some months later the destroyed bone seemed to have regenerated itself.

2. Velma E., female, aged 13, white, a well nourished child, presented a sinus of the right upper lid near the inner canthus, which showed the earmarks of a bone necrosis; she gave the history of having had a phlegmon of the lid on each side which had been lanced—the left healed, but the right continued to discharge.

A rhinoscopic examination showed ethmoiditis of the right side and the X-ray showed the other sinuses on that side clear and all clear on the left.

A free incision done on the diseased area showed the ethmoid and turbinates on that side full of pus and polypi. Free drainage relieved the trouble promptly, but I am told that the condition subsequently recurred on the oposite side.

3. The case of Christine A., white, aged 6, female, illustrated an aberrant type, so far as my classification goes, and she shows what may come from bad teeth though it was not exactly an orbital suppuration. The child had a decided etropion of the left lower lid, due to a chronic suppurating sinus.

The antrum was clear on transillumination and X-ray, but at the lower end of the sinus, discharging inside the cheek, were several badly placed and decayed teeth.

The sinus burrowed along the outside of the sup. max. bone and did not enter the antrim, although a large sequestrum, together with several teeth were curetted away. Just why the sinus should have taken this direction I am unable to say.

The following cases hold the most interest for me in several points of similarity, in that the source of infection could not be found, and because they show how much interference the eye will stand without permanent injury to vision:

1. Baby K., 3 or 4 years of age, I saw in consultation with Dr. Oden. The doctor had treated him for a week, or more, for a mild nasal pharyngitis when the left eye began to show signs of inflammation, redness, edema of conjunctiva, protusion of the eyeball and swelling and redness of both lids; he ran a mild temperature, but had no other evidence of constitutional involvement. It had not been possible to make a reasonable diagnosis of the intra-nasal, or accessory sinus infection. Smears and cultures from the nose showed only the usual organism. Eventually an exploratory incision was made deep into the orbit, both below and above the globe, evacuating thick pus from both incisions. The tracts went down upon the bony walls of the orbit, but bared or necrotic bone could not be found in either. The superior one closed promptly, the lower one drained for weeks, but finally both healed perfectly and permanently. There was no impairment of function of the eye, and but little deformity remaining from scar tissue.

2. Ardie P., white, male, aged 13, came on July 21, 1921, with the history of having had a swelling begin in the left eye

10 days before; he had a temperature of 100 and seemed to be a very sick boy; he was suffering much pain in the eye, which was red, edematous, swollen and markedly protruding so that the lids were stretched tight over the globe. The vision was 20/70—movement impaired. The ophthalmoscopic examination was negative, except for somewhat tortuous and enlarged veins. The nose and sinuses were negative on rhinoscopic examination and clear on transillumination and X-ray. It was necessary to do a cantho-plasty in order to gain access to the orbital cavity. A deep incision below the globe disclosed a small quantity of thick pus. A careful probing failed to disclose necrotic bone anywhere. At the end of one week the wound was still draining with much edema and considerable protrusion of the globe, but the constitutional symptoms having subsided and the local symptoms improving the patient went home. A month later the wound had healed, the protrusion of the globe was less and the vision 20/30. At the end of the 2nd month the vision was 20/15, a slight but noticeable protrusion of the globe remaining.

I think we are justified in concluding from such cases as these that suppurative conditions of the orbit are not uncommon; that the eye is remarkably tolerant of such suppurations, bearing in mind, however, that grave results may follow from secondary involvement of the optic nerve and other eye structures; that proper attention to acute and chronic infection in and about the nose will anticipate and prevent many of them; that radical and early surgical treatment is both justified and advisable.

New Orleans Medical and Surgical Journal

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EDITORIALS.

DR. C. C. BASS, DEAN.

Dr. C. C. Bass has been appointed Dean of the Tulane School of Medicine. Since the foundation of the school, nearly one hundred years ago, its Dean has been regarded as the leader of the Medical Profession of this section of the country. This was largely due to the position, but has been maintained by the fact that the successive Deans have been men of the highest character and attainments.

We believe that in selecting Dr. Bass, the administrators of the university have chosen one who will take his position and administer his office with the same high ideals, and the same energy and integrity as those who have preceded him.

The choice is particularly agreeable, we believe, to the medical profession, as Dr. Bass is widely and well known all over

the country, and is familiarly known to the local profession as a scientist of unrivaled repute. We believe it would have been a disastrous mistake to select any but one of our own graduates, a fellow practitioner and citizen, for our leader; in fact, if Tulane cannot produce men in every branch fit to occupy any of her highest positions, she certainly is not fulfilling the bright dream that her sons and daughters have dreamed of her, and that we believe is on the brink of its complete fulfillment.

Dr. Bass has twenty years or more of service to the college and the profession before him, and we predict that these will be the brightest years in the history of the school.

It must always be borne in mind, however, that no great advances can be made in organization of the teaching and research until funds are available, and Dr. Bass can be expected to make few changes at the present time. With his ability, and the confidence and good will of the profession, the teaching staff and the student body, only brilliant success can await him.

CHAILLE JAMISON.

THE CIRCLE.

It is only when some untoward thing happens that the average of us is brought face to face with a realization of the continuous action of the laws of nature—and also that gross violation of them simply means death.

A rather common summer and fall sport in our Southland has been to accuse farmers and others of poisoning fish in large numbers.

The newspapers frequently carry such reports and recently we saw one such report, where thirty farmers had been arrested for this offense in one locality.

About twelve years ago enormous numbers of fish, of all kinds, died in Lake Maurepas, Pontchartrain and tributaries, the wave of death making a circuit of the shores.* There were so many dead fish floating in these waters that one almost wondered that there had been so many in the world. The extent of destruction may be visualized when you realize that on this occasion nineteen railroad carloads of dead fish were removed from the section of the New Basin Canal, New Orleans, extend-

*See report of Hamilton P. Jones, M. D., in the Bi-Annual Reports, State Board of Health.

ing from the I. C. Depot to the Half Way House. It was charged that these fish had been deliberately poisoned by man, just as tuberculosis among the French soldiers was attributed to the machinations of an active human foe and as was our more recent influenza scourge, but none of these tremendous destructions could have come about except through the effect of entirely natural phenomena. So far as the death of the fish is concerned, this is what occurred.

Conditions of food supply, heat, light and all that goes to create environment being favorable to the growth of a particular algæ, in this case the water plant Amabena Flos Aquæ (frequently seen in water as a light green silky veil). It multiplied prodigiously until overcrowding occurred, food ran short, environment became unfavorable and the Algæ died.

Dead things are the principal food of bacteria, most numerous and ever present are the putrefactive bacteria, saprophytes, which are generaly ærobic.

The saprophytes, living on the dead Algæ, increased in numbers because of their now favorable environment, but being ærobic, they had to have oxygen to live. Naturally they took it from the medium in which they were, namely the waters of the lakes. Their number being great enough they entirely denuded the waters of its dissolved oxygen, upon which fish depend for their oxygen supply, and quite naturally the fish died of oxygen starvation, the environment for the fish now being changed.

This is the gross outline of the phenomenon. But how many steps were there? How many types of bacteria each doing its mite towards change, or preparation of a more or less favorable environment for their successors? Not one single element concerned in bringing about any phenomenon is independent of any other element concerned. There is no single causative factor for a disease—no one organ is independent of any other—they interlock and are absolutely related. You cannot have a disease of the teeth only, of the ovary, or of the gall bladder. Interdependence, and endless cycles, seem to be the inexorable law for everything, man included.

HAMILTON P. JONES, M. D.

SOCIETY PROCEEDINGS.

PROCEEDINGS OF THE HOTEL DIEU STAFF.

Monthly Meeting for April, 1922.
The President, Dr. Homer Dupuy, in the Chair.

URETERAL STONES.

Dr. H. W. E. Walther exhibited a large collection of ureteral calculi which he had removed by intravesical manipulations through the cystoscope. He also exhibited his flexible metallic ureteral sound with filiform guide which he had devised for surmounting so-called impassable obstructions in the ureter.

He called attention to the fact that at least 90 per cent of ureteral stones can be removed by non-operative procedures by the urologist; that many conditions causing vague abdominal pain are erroneously diagnosed appendicitis, cholecystitis, etc., when the true condition is stone in the ureter. He contended that the X-ray was not employed by the clinician as assiduously as it should be. Then too the microscopic urinary findings are passed upon too lightly. Some physicians actually feel that a few blood cells in a urine is perfectly normal. Such is not the case.

It is the cystoscope and the ureteral catheter however that are of paramount importance in the accurate diagnosing of ureteral stones. The speaker stated that he did not use wax-tipped catheters, (whereby one is supposed to diagnose stone by the scratch marks on the wax), because of the difficulty of interpreting accurately such marks. He placed chief value on (a) X-ray findings, (b) urine findings, and (c) ureteral catheter meeting with definite obstruction at point, that with aid of X-ray, makes one feel reasonably certain is a stone.

Dr. Maurice Couret agreed with Dr. Walthers that frequently we dismiss too lightly the presence of a few red blood cells in the urine.

Of course we should be sure that their presence is not from some physiological phenomenon for example, menstruation, or the result of trauma to the ureters bladder, etc., with the cystoscope. In the absence of these factors, even an occasional blood

cell should be looked upon as an omen of serious trouble somewhere along the urinary tract.

Dr. L. A. Fortier felt that this subject is a most interesting one to all radiologists. In his department he had frequently seen cases of ureteral calculi that were treated by dilitation with complete success. The stones progress slowly downward, at times slip temporarily higher in the tract. Some of the cases passed the calculus per urethra without their knowledge. This fact was proven by negative X-ray findings as well as the disappearance of all symptoms.

While on the subject of calculi, he thought the technique a good one as followed by some of the Staff, in having the patient X-rayed for the exclusion of renal calculi before operating on the indefinite chronic appendices.

RHINOPLASTIES.

Dr. Louis Levy said that he wanted to share honors with Hotel Dieu, by having the first Rhinoplasty done in the institution. Having been impressed by the reading of Dr. Tique's article and seeing cases coming from Cincinnati, Chicago and New York and other medical centers, he felt for some time that New Orleans was not keeping up to her usual pace in this work. He presented cases that he thought would exemplify the amount of work that should be done along these lines.

I. RHINOPLASTY II.

Showing case I. before and after operation.

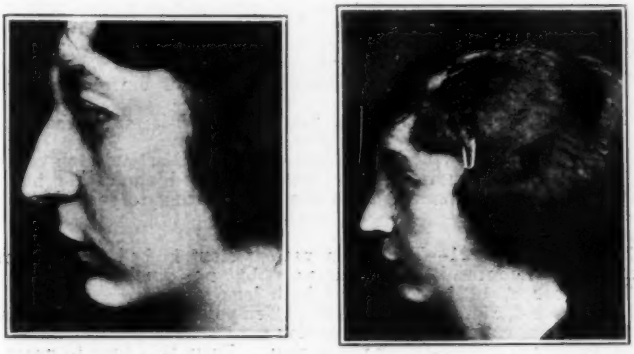
An individual has no more right to carry an unsightly nose than he has to carry any other deformity. Stress is laid on

the correction of deformities like bow-legs, knock-knees, cross-eyes and other unsightly things about the human economy. They do no harm in themselves with the exception of breeding timidity yet are unsightly to the eyes of others.

Dr. Levy felt that the operation for correction of deformed noses for the general surgeon accustomed to doing plastic work was so simple and the results so gratifying, that he predicted it would be but a short time when the general plastic surgeon would be doing Rhinoplasties.

The Operation: Local anesthetic is used—Novocain preferably, with additional Adrenalin. The nose is thoroughly anesthetized by infiltration from within the lower half and without the upper half, all the way from the tip of the nose to the distant point in the mid-orbital plate. If deviation of the septum is present, it is corrected by submucous resection. Incision is made from the tip of the nose to a point just short of between the brows and is carried down on the sides, raising the tissues from the nasal bones. All of this work is done from within the nose by special pointed scalpel elevators. The field is then open and by palpation and with a special saw, the hook is sawed off and with Joseph's rasps, the bones are rasped down to a smooth surface to their normal size. The tip of the nose is then elevated or lowered by removing a triangular piece from the septo-nasal junction at the tip. It is shortened by the width of that part removed. At this same exposure bones can be raised or grafts can be placed correcting the visual nose deformity.

While this is a comparatively new operation, there is no case that should take over one hour to do.



I. RHINOPLASTY II.

Showing case II. before and after operation.

Dr. Will Patton called attention to the fact that Dr. Levy was mistaken when he said that a sub-mucous is an easy operation. He also stated that every Ear, Nose and Throat man was

doing rhinoplastic work unbeknown to Dr. Levy. The hump nose presents the fewest operative difficulties. The type of cases which call for skill are those in which there is a previous fracture of the nasal septum high up. The septum in such instances is twisted to one side with a crooked outline on the outside. Dislocation of the alæ of the nose and other anterior deformities offer many more difficult mechanical problems than we get in the simple hump on the external surface of the nose. Dr. Levy's results as shown by these pictures are most excellent.

RAYNAUD'S DISEASE

Case Report by Dr. Jerome Landry.

Male, 42 years of age, admitted to the Hotel Dieu August 23, 1921. Family and past history are negative.

Eight months ago, December 23rd, came home at night complaining of severe pain in big toe: this member was cold. Thinking the sharp, shooting pains due to exposure to rain and cold, little attention was paid to this condition, but the next day pain had increased and four days later he consulted a chiropodist, with no results. He began going the rounds of different doctors and hospitals and was given the usual treatment, including intravenous injections of Ringer's solution, salvarsan and other anti-luetic treatment. He was sent to Hot Springs for baths, but all this without any relief.

During this time, from December 23rd to September 2nd, patient did not once sleep in a bed, but was supported on crutches against the wall, or for a few minutes in a chair, on account of the agonizing pain experienced whenever the feet were put on a level with the body. He was given large doses of aspirin, whiskey, codeine, morphine and other opiates, which gave practically no relief.

The patient is anemic, has a tired, worn expression, is very nervous and excitable, and there is edema of both lower extremities from the knees down.

There is gangrene of both big toes: the right is moist, the other more or less dry, both very sensitive.

September 2, 1921, under gas anesthesia, a disarticulation of the right big toe, through the first metatarsal and cuneiform bones, was done. Nothing was done to the left, waiting to see what this operation would do.

Progress Notes:

September 2, 1921—This night patient slept in bed for the first time in nine months. Some little pain, but not much.

September 3, 1921—Edema of both legs gone.

September 4, 1921—Without pain. Temperature 102. Sutures all removed on account of some infection.

September 5, 1921—Other toe drying. From this time to present date patient has gradually improved. Sleeps well and has not taken any opiate, aspirin, etc. What was the cause of the other toe healing? Was it due to the rest in bed causing the edema to subside by relieving pressure on the vessels?

August, 1922—Patient back at work again.

Laboratory Reports:

Complete laboratory examinations made, including cultures for all types of organisms, blood and urine. Tissue examination shows

obliterative endarteritis and endolphlebitis (Raynaud, however, claims he was never able to find any changes in the vessels).

In 1862, Raynaud contributed to medical literature his "Thesis"; in 1872, "Gangrene," and in 1874 his "New Researches."

His attention was first called to this subject by a case of spontaneous symmetrical gangrene which came under his observation in 1861. He was able to get together twenty-five cases upon which to base his thesis.

He believed that the condition was brought about by the continuous spasm of the arterioles and venules. He also pointed to the abnormal irritability of the vasomotor centers.

It has long been known that under the influence of cold the fingers may undergo a change of color, becoming white, and even blue. This condition has been designated the dead finger (digiti mortuus). Raynaud called this local syncope, and others, such as (Weiss) local anemia, or (Barlow) regional ischæmia.

Raynaud applied the term local asphyxia to the affected part when it manifested a blue appearance; Weiss suggested the term regional cyanosis and Barlow that of local cyanosis. Symmetrical gangrene is the culmination and one of the distinctive features of Raynaud's disease. Raynaud's clinical tripod then is local syncope, local asphyxia and symmetrical gangrene.

Symmetrical gangrene is not a common disease. Local syncope and local asphyxia, or either, may occur for years and then disappear without any manifestation of gangrene. The disease may occur as a pure neurosis, or it may be associated with a great many other conditions. Hysteria, tabes dorsalis, syringomyelitis, spinal tumors, syphilis, diabetes, erythromelalgia, the breaking off of morphine, etc. are all important etiological factors.

Local syncope comes first in the trinity of symptoms. It may exist alone or it may be associated with local asphyxia, a very frequent combination, or the three symptoms may be present. Numbness and stiffness in the digits affected may usher the attack, or there may have been in the extremity, or parts involved, for days or even weeks previous, severe pain which is intensified as the attack develops.

The seizures are paroxysmal. The parts involved become paler, even corpse-like; they do not bleed when pricked, are cold, and movement is difficult. The latter, Raynaud suggests,

is due to the defect of afferent impulses and not to muscular weakness. The nose, cheeks, chin and ears are seldom invaded. The condition is seen more often in the extremeties, i. e., feet and hands.

Local asphyxia may, or may not, be attended with pain: often this is absent unless the cyanotic part is handled. The pain at times becomes neuralgic in character, or it may be continuous, and it varies from a slight discomfort to an intense agony.

Symmetrical gangrene is the last and most important of this trinity of symptoms, although it may occur unilaterally. Desquamation of epithelium may be the only evidence of necrosis. Raynaud described a peculiar type of blister, a large bulla, of a deep brown color when dry, due to the gangrene of the papillary layer of the derma. Necrosis may attack one or more of the phalanges of the digits, or a portion of the foot, or even the entire foot. In one of the cases reported both legs became gangrenous.

The prognosis of Raynaud's, as a rule, is good, and when associated with other morbid conditions it is that of the underlying disease. The Scotch verdict "not proven" should be applied to those cases which are reported cured.

The Treatment: The underlying cause, of course, should be removed if possible.

Atropine has been used with more or less benefit, given with the idea of relieving spasm of the vessels.

Koga, of Tokio, suggested modifying the viscosity of the blood by massive injection of salt solution. McArthur, of Chicago, to avoid the inconveniences of such injections substituted duodenal irrigation with Locke's solution.

Pasman refers to two cases of obliterative endarteritis in which, after other methods failed, he obtained distinct amelioration from the use of Locke's solution for ten days. In another case, notable improvement was evident after fourteen duodenal irrigations of four liters each.

When gangrene occurs amputation is indicated.

PROCEEDINGS OF THE TOURO INFIRMARY STAFF.

Monthly Meeting for April, 1922.

The President, Dr. C. Jeff Miller, in the Chair.

GOITRE.

Dr. A. B. Pitkin presented a number of thyroid cases to bring out the usual types of thyroid disturbances seen along with metabolic measurements. Because of the limited time and the crowded program these cases were not dealt with in detail. Of the different types he mentioned first the goitre of adolescence. His experience was that this type of patient has as a chief complaint—if not the only one—the enlargement of the neck and very few apparent symptoms characteristic of disturbances of the autonomic system. The metabolic measurements back this up as the alteration, if any, is well within the limits of normal variation. The cases which he saw, had alterations of the metabolic rate between minus 5% and plus 7%. The next type mentioned was the fœtal adenoma. This is first noticed by the patient at the onset of puberty; the usual history is that the gland enlarges at each menstrual period temporarily and as time goes on it gradually and slowly increases in size. This type may become toxic, the average duration of the goitre before this occurs is about 20 to 30 years or longer. When thyrotoxicosis is present any or all of the characteristic disturbances may be manifested with the exception of exophthalmos which is not seen unless it is a case of true Graves's disease. The clinical picture may present any degree of toxicity, but a very striking thing is that the metabolic measurement seldom shows an alteration in excess of plus 45%. The "diffuse adenomatosis" of Goetsch is also a distinct entity and a very troublesome condition to the clinician because the patient's symptoms are of a mild chronic hyperthyroidism, the type of case which would be more quickly branded "borderline," tuberculosis, neurasthenia, etc. The metabolism measurements in these cases is normal or slightly altered.

Another type commonly seen is the simple cystic or colloid goitre. This type is well-known and the measurement of the metabolic rate shows no alteration. There is a type of colloid goitre, however, which is associated with a tryrotoxicosis. The

usual history is that of periods of marked symptoms of toxicity alternating with periods of quiescence. Boothby claims that in these cases there is a focus of infection which causes a disturbance and excessive secretion of thyroxin and during the quiescent period there is an accumulation of excessive secretion of the colloid, the end result being a large colloid goitre with thyrotoxicosis and microsopically a few areas of hyperplasia are found in the gland.

The next type is the well known entity of Graves' disease with its endless chain of symptoms and serious disturbances resulting from excessive stimulation of the autonomic nervous system. The usual and commonest findings are loss of weight, fatigueability, loss of strength, tachycardia, tremor, perspiration, vasomotor instability, nervousness of varying degrees, possibly some of the eye signs,—Von Graeffe, Stelwag, Moebius, Dalrymple, and in the great majority of cases varying degrees of exophthalmos and marked alteration of metabolic rate.

There is another class of case which is occasionally referred for a metabolic measurement, the entire picture and the findings being troublesome to interpret. They present symptoms which usually amount to fatigueability, varying degrees of tachycardia, nervousness of varying degrees and usually underweight. There is no finding suggesting a definite earmark of hyperthyroidism, the metabolic measurement proving to within normal limits or slightly lower than the normal variation. A small number of such cases react positively to the adrenalin hypersensitiveness test. It would appear from the opinion of Goetsch and Woodbury that these are really cases of a mild chronic hyperthyroidism, probably of the diffuse adenomatosis type. But Dr. Pitkin was not convinced sufficiently, or felt that probably he had not seen enough of them to warrant this diagnosis. Many cases termed N. C. A. in the army or effort syndrome, present very similar pictures and findings. Recently it was suggested that in these cases there is actually an increase of thyroxin in the tissues accounting for the autonomic disturbances, but there is not any thyroid irritability present accounting for the stationary weight and metabolic measurement.

THE METABOLIC RATE.

Goitre of adolescence: In Dr. Pitkin's hands the alteration of the metabolic rate was well within normal limits. The rate

may be high and as Goetsch has pointed out, it may increase in severity and terminate as a true hyperplastic goitre.

Toxic foetal adenoma : The average and usually the maximum alteration of the metabolic rate was plus 45%, regardless of the suggestion of the clinical picture.

Colloid goitre with thyrotoxicosis: The metabolic rate was altered as in toxic adenoma.

Graves' disease: The metabolic measurement showed an average of about 60% but not often higher. The highest rate he ever saw, after repeated observations, and with the best conditions, was plus 110% and was found in one of the patients presented. The next highest was plus 95%, in this same case and another one.

Dr. Pitkin demonstrated his cases as follows:

The patient was a typical case of goitre of adolescence. Her metabolic measurements had shown –5.9%, plus 0.05% and plus 7.2% on three observations. She was fifteen years of age and had noticed an enlargement of her neck for one year, synchronous with the onset of puberty. It had not increased in size and she presented no symptoms objectively or subjectively of any disturbance of the autonomic nervous system. She came to the clinic for treatment because of the large neck—cosmetic complaint—typical of the usual case of this type. With the idea of Marine in mind, which is prophylactic, this patient was made to take sodium iodide for three weeks and then hormotone tablets were added. She was watched very closely and no change was noted in any respect.

The next two cases were type cases of the fœtal adenoma of the thyroid with thyrotoxicosis. One patient was seen and examined on February 12th and at that time her metabolic measurement was nearly plus 50%. She was ambulant and reported from her home the next morning for the observation which, it was thought, accounted for some of the increase in her rate. Two other observations showed plus 40.9% and plus 43% when at rest in the hospital as a patient. She first noticed that her neck was gradually getting larger four years ago. Her age was 27. She had a well defined, enlarged thyroid, plainly seen, and had when first observed a heart rate of 90 to 100. No bruit nor thrill, but tremor was present. She complained of some trouble in swallowing. She was very nervous, cried easily, was

easily excited. There was no palpitation. Since at rest in the hospital her pulse dropped to 72 and she presented an entirely different picture than she did when first admitted, even though she was probably a bit nervous because of all of the new faces and of being talked about.

The other case was of the same type. She was 18 years of age. The thyroid was generally enlarged. There were no definite mass or masses, doughy in consistency. She was very nervous. She cried easily and also was excited easily. There were present palpitation, negative eyes, pressure symptoms on the trachea, termed by patient "smothering spells," and a cough. Two observations of her metabolic rate were made before admission to the hospital; they proved to be plus 58% and plus 42%. One very striking feature in the observations made on these cases during their stay in the hospital was not only the improvement in their general condition but the effect on the metabolic measurement. With the first case, after two weeks the metabolic measurement was perfectly normal –0% variation; in the other case the rate was found to have been lowered 50% and at present was plus 20%.

A case of simple adenoma of the thyroid without thyrotoxicosis failed to report. She presented the same gross findings in the thyroid, but had a pulse of 75, was not nervous, had temporary enlargement of the neck at each menstrual period, was 29 years of age and had a metabolic rate of plus 17%. The latter would probably be normal if the patient could be kept in the hospital over night.

The next two cases Dr. Pitkin thought were beautiful examples of Graves' disease and yet presented marked differences. The more toxic of the two was of shorter standing. Another thing was that it was at least not the usual thing to see this disease in a man. The woman was 18 years of age. Her occupation until a year ago was in the Transit Department of a bank. She had never been sick before. One year ago she had a "nervous breakdown," which necessitated her stopping her work and she had not resumed it since. She felt a great deal better at times and also had her bad days. This continued until three months ago when her friends and relatives repeatedly remarked about the prominence of her eyes. This is the one main reason that she came to the clinic and first consulted Dr.

Blum. She was then referred to the Medical Clinic and then to Dr. Pitkin for a metabolism measurement. A complete summary of the findings in this case after prolonged observation and a minute history are, fatigueability and the loss in weight from 150 pounds to 103 pounds, and a slightly enlarged gland. Her metabolic measurement was plus 68% and plus 52%. The exophthalmos as could be seen was very marked. She was feeling very well of late and she has been going out a great deal. This was probably a period of remission.

The other case was shown in contrast. The man was perfectly well before the present trouble; his occupation required hard manual labor. About 7 months ago he noticed a lump in his neck to which he paid very little attention. The neck had gotten larger gradually. He became very nervous and lost nearly 50 pounds in weight. He tired easily, was extremely nervous and apprehensive, had a marked tremor. There was very little suggestion, if any, of exophthalmos. He had the Von Graeffe and Moebius signs. The gland was markedly enlarged, particularly on the right. There was a very distinct bruit and thrill over the entire gland. He had been under medical treatment and observation for two weeks before coming to Touro, and the first attempt to discern his metabolic rate was very unsatisfactory because of the extreme apprehension and lack of sufficient co-operation. Dr. Pitkin called those experiences "rehearsals." He finally managed to get a fairly satisfactory observation of plus 110%. The patient was put to bed for two weeks, kept very quiet and given forced feeding. When he returned for another measurement, he had improved remarkably, apparently or subjectively. The observation was extremely satisfactory and the rate was found to be plus 95%. A week later a third observation was made and found to be plus 78%. The fourth attempt, a week later, after complete rest in the hospital, was plus 80%. This was a surgical case without a doubt and he wanted treatment. The evident question was whether this man was a good surgical risk? His pulse had dropped from 130-140 when first seen, to 80. Sitting in front of strangers he was apparently undisturbed and quiet even though there must have been a little excitement present. He was entirely a different man than when first seen 4 or 5 weeks ago. His respira-

tion was 20 and below, and he had gained over 5 pounds in weight.

Dr. Pitkin thought that the answer to the question of operability was to be found in the metabolic measurement on the one hand, and the clinical picture after observation, on the other. He felt that the clinical picture was by far the most important factor though material aid was obtained by metabolic measurements. He thought the patient was a good surgical risk and that it would only be a very short time before he could be safely recommended for surgical interference and treatment.

Dr. C. L. Eshleman said that the benign enlargements of the thyroid, such as sometimes occur during adolescence and pregnancy, do not require much consideration. They were usually a simple hypertrophy of the gland and required no treatment, but should be watched for any symptoms of thyrotoxicosis which might develop later along with other changes in the gland. Two other types, the toxic adenomas and the true exophthalmic goitres should be differentiated. The important points in differentiation were as follows:

Toxic adenomas.	Graves or Basedow's disease (Exophthalmic Goitre).
Weight: Only moderate loss, if any.	Very marked and usually rapid.
Diarrhoea: Not usual.	More frequently noted.
Tremor: Frequently absent.	Marked and practically always seen.
Tachycardia: Moderate, 90 to 100 per minute.	Very rapid pulse, 100 to 140 or more.
Thyroid: Often markedly enlarged, hard and nodular, frequently one lobe larger than the other.	Usually a symmetrical uniform, moderate enlargement, sometimes barely noticeable; very vascular and sometimes pulsating.
Exophthalmos: Frequently absent.	Present.
Basal Metabolism: Moderately increased.	Very high—plus 50 or higher.
Goetsch Adrenalin Test: Varies; usually positive.	Strongly positive.

The cases showed these different types.

Dr. Eshleman presented three cases of toxic adenoma:

Case 1: M. G., 29 years old, complained chiefly of nervousness and general malaise. Says she gets "all in a tremble" when excited. Recently had to stop work on account of malaise. Has lost no weight, has no tremor, pulse 80 to 90. Both thyroid lobes and the isthmus are enlarged and she has a basal metabolic rate of plus 17. Rather a mild case and has improved steadily under medical treatment.

Case 2: L. G., had a moderately enlarged thyroid, the right lobe larger than the left, hard and nodular. Pulse rate was 90-112, had

lost 30 pounds in 6 months, had slight tremor at times and complained of nervousness and tired easily. Her B. M. R. was plus 30. The Goetsch test was slightly positive. She was a case of toxic adenoma also. After ten weeks of medical treatment she had gained 12 pounds and was much better.

Case 3. G. M. This woman had a very much enlarged thyroid of the same adenomatous type first noted four years ago. The left lobe extended much higher than the right, was quite hard and nodular and rather freely movable. She complained of nervousness for two years, cried frequently, had slight dysphagia and dyspnoea at times (evidently pressure symptoms), had no diarrhoea, no loss of weight, in fact, was gaining, had no palpitation. Two B. M. R. observations showed plus 40.9 and plus .43. To be operated shortly. Goetsch test was positive.

Case 4. This was a truly remarkable case of exophthalmic goitre who had been under treatment for eleven years, who had never been operated and whose disease had an unusual course, shown previously 8 years ago when at her worst. Dr. Matas was not inclined to operate. In 1903, while in a theatre, she was called out and told that her husband was dead. The shock was great and she was nervous for a long time. Shortly after she noted tremor while trying to thread a needle; this was followed by exophthalmos. For eight years she went to many doctors and was treated with X-rays, serum, inoculations and other methods. She finally came to Dr. Eshleman in 1911 when 43 years old. She was in a very serious condition. The exophthalmos was still present. She had all of the other classical eye signs, very marked loss of weight, highly nervous, and marked tremor. The thyroid was enlarged symmetrically and very vascular, but never very large. Pulse 112 to 130, irregular, mitral leakage, systolic pressure 140 to 175, a typical severe case of Graves' disease. Several times during the subsequent few years she showed serious heart embarrassment, oedema of legs and lungs, haemoptysis and passive congestion. But she came through all of them under prolonged rest, digitalis and sedatives. About 1916 she began to show subsidence of her toxic thyroid symptoms, was gaining weight, not so nervous, thyroid getting smaller, tremor subsiding. At present the thyroid has atrophied to such an extent as to be unnoticeable, she is rarely nervous, has grown very stout and is quite comfortable except for the badly damaged myocardium which has resulted from the prolonged toxicity. Recent B. M. R. observations showed plus 48 and plus 35, but at present her Graves' disease was in the background and she was no longer toxic, but suffering from the residual myocardial effects of many years of severe thyroid poisoinng. She had been eleven years under observation and treatment and eight years previously under others. No credit was claimed for having cured the hyperthyroidism. The gland might have atrophied naturally. She had rest and sedatives and quinine hydrobromate and chromium sulphate. He did not think any one drug or thing cured her. Some few cases ran this course, but rarely so.

The treatment of these two types of goitres is not always surgical in Dr. Eshleman's opinion. The mild cases of toxic adenoma could be medically treated and benefited. He had a number of them improving under treatment in the out-patient department in whom surgery had seemed unnecessary. Others with more toxic symptoms were surgical and should be so treated. He thought true exophthalmic goitre was rarely a disease

which could be permanently benefited by medical treatment. A few apparently did well for a time, but the risk was too great. They should usually be attacked surgically as soon as possible.

Charts prepared by Dr. Scott were exhibited illustrating the Goetsch test which was done on several patients. The test consists of the hypodermic injection of ½ cc. of Adrenalin making careful observations at short intervals thereafter of any rise in pulse rate and blood pressure and any subjective symptoms which develop. A positive reaction is a marked rise of pulse and blood pressure with such symptoms as nervousness, tremor and consciousness of rapid heart action by the patient. The phenomena occur almost immediately after the injection and persist for 30 to 45 minutes, gradually subsiding in about one hour. Dr. Goetsch lays considerable stress on a positive response as an indication of thyrotoxicosis when done in the borderline cases with thyroid enlargement and a few suggestive toxic symptoms.

Dr. Eshleman thought that some individuals with a highly sensitive nervous system showed a rise of pulse and blood pressure from purely psychic causes. For instance, a young man in the ward with supposed neuro-circulatory asthenia was approached with the hypodermic and before it was administered his pulse-rate and blood pressure rose considerably. Since then he had been giving a hypodermic of sterile water first as a control test. Allowance should be made for this psychic rise, which was shown on one of the charts (case of Miss D.) before the hypodermic was given. Following the hypodermic she showed a very characteristic and unmistakable positive reaction.

Dr. Lemann thought that the number of cases presented was striking and wondered if thyroid enlargements were on the increase. In the last few years spent in the clinic he saw more enlargements than in previous years. He tried to see if there was any correlation between drinking water and thyroid enlargements when New Orleans was in the transition from the cistern water to river water from the water works. He inquired what kind of water the patients were drinking and found no relation between the drinking water and the thyroid enlargements. This was perhaps because the number of cases was not great enough.

Dr. Matas said that this discussion, preceded by Dr. Pitkin's report reminded him of the growing frequency of goitre and especially toxic goitre in this section of the country and in the United States. The evil reputation of certain valleys and mountain countries of Europe as endemic foci of this disease is rapidly being transferred to the United States. The great incidence of goitre in this country was brought about most strikingly by the survey of the pathology displayed by the war recruits examined in 1917. Whatever may be the reasons for this increased incidence of thyroid disease the fact cannot be denied that its prevalence has enormously increased in our midst. The number of thyroid patients, white and black, who now apply to our clinics is vastly greater than those whom we so recognized in the same clinics 30 and 40 years ago. He believed that the toxic types, thyrotoxicosis and exophthalmic goitres, are being thoroughly Americanized. At any rate, the place to study goitre in all its manifestations is no longer Switzerland, the Tyrol, or the Pyrenes, but in the great clinics and surgical centers of the United States, for example, Rochester, Cleveland, New York, Boston, Philadelphia, Baltimore with New Orleans and the southern cities furnishing an abundant quota.

While the recruiting experience of the war showed how goitre was prevalent all over this country experience continues to show that goitre, and especially toxic goitre and Graves disease, are still largely gynecological affections. In Dr. Matas' experience, the proportion of 9 women to 1 man or 90% women was not an exaggeration. This no doubt accounts for the frequency with which gynecologists had appropriated many of these cases as part of their domain. But he noted that not a few of the more dangerous toxic and exophthalmic cases as well as the retrosternal, were still allowed to find their way to the general surgeon.

Much has been written about the causes of goitre and in the endemic foci of Europe, water pollution of a certain specific type has been held chiefly responsible for its presence. In this country and especially since the war, and with the great increase of the hyperthyroid and toxic types—we must appeal to other causes. Hyperthyroidism, largely a female disease, is undoubtedly related to the sexual functions and the emotional life of woman. The frequency of toxic adenoma and exoph-

thalmic goitre at puberty and among brides and especially "war brides," illustrates the sexual relationship which has always existed, but has undoubtedly grown more important in later years in this country, especially where the economic and political equalization of the sexes is asserting itself since the "suffragette" has come to her own, and where freedom of the social relations between the sexes has increased. The war brought with it an enormous stock of hyperthyroidism to the women of this country; but "jazz," "joy rides" and short skirts have contributed a liberal share to the growth of this menace to American womanhood. In the endemic foci of Europe it may be that tainted waters are at the fountain source of simple endemic goitres, but here, it is not the water we drink, but the pace at which we live that makes the "poison goitre" grow.

The American Medical Editors' Association will hold its 1922 meeting, October 16-17, at the Hotel Statler, Cleveland, Ohio, during the Annual Convention of the American Public Health Association.

NEWS AND COMMENT.

NEW DEAN AT TULANE. The board of Administrators of Tulane University of Louisiana, on July 31st, elected Dr. C. C. Bass as dean of the School of Medicine. Dr. Bass well merits the honor. His original work in malaria brought forth international commendation. He enters upon his duties with the good wishes of all his medical friends.

THE NEW BAPTIST HOSPITAL. The home mission board of the Southern Baptist Association has been instructed to build a general and research hospital in the City of New Orleans, to cost $2,000,000.

CHARITY HOSPITAL IN NEED OF FUNDS. The Charity Hospital, New Orleans, has requested a bond issue of $300,000 which Gov. John M. Parker vetoed as unconstitutional after the bill had passed the Senate and the House. The money is badly needed for an additional building for internes and also for nurses. The internes' home was erected thirty-three years ago to house 18 internes. There are now thirty crowded in, and others have to seek accommodation elsewhere. The nurses' home is seventeen years old and was originally intended to accommodate one hundred and two. The hospital now has two hundred nurses.

NEW SANITARIUM TO OPEN IN SEPTEMBER. The St. Luke's Private Sanitarium, located in New Orleans, opposite the new Texas & Pacific railway station, in Annunciation Street, will be ready for the reception of patients about September 20th. Dr. B. F. Gallant, formerly assistant superintendent of Charity Hospital and later medical director of Belvedere Private Sanitarium, has been appointed medical director. St. Luke's recently acquired the buildings and grounds of the St. Simeon Select School. These buildings are undergoing changes which will modernize them. This sanitarium will be conducted as a most modern and scientific institution for the care and treatment of constitutional diseases, cardio-renal and metabolic disturbances, functional neuroses, and is especially equipped to care for mild nervous cases where rest and recuperation are desired. Infectious diseases will not be cared for. The institution will also be able to care for a limited number of surgical operative cases as well as surgical convalescents from other hospitals.

Foreigners As Assistants in Italian Clinics. On the initiative of the Italian League for the Protection of National Interests, the Faculty of Medicine of the University of Rome has granted foreign physicians the privilege of entering the Medical and Surgical Clinics of the University of Rome in the capacity of assistants without salary—a measure which has been adopted with marked success by the Universities of France.

These Roman Clinics are under the direction of the greatest Italian physicians and surgeons.

The following places are available for the next Academic year, which begins in the first week of November.

Two places in the Surgical Clinic; 2 places in the Medical Clinic; 2 places in the Obstetrical Clinic; 2 places in the Dermosyphilopathic Clinic; 2 places in the Clinic for Mental and Nervous Diseases; 1 place in the Orthopædic Clinic.

Foreign physicians are admitted also to the numerous finishing courses offered by the Medical Faculty of Rome.

Applications may be addressed to the President of the Faculty of Medicine of the University of Rome accompanied by a certificate of graduation and a favorable recommendation from the President of the applicant's Medical School.

Applications with documents will be received also by the Italian League for the Protection of National Interests—(Lega Italiana per La Tutela degli Interessi Nazionali) Roma (8) Corso Umberto Primo No. 101, which will furnish all required information.

St. Rita Surgical Infirmary, 1373 Annunciation Street, New Orleans, is improving its facilities.

Since the opening of the institution little over a year ago, the demand for more hospital beds has been so great that it has been deemed necessary to purchase the twin building next to the Infirmary. Incorporating this building will form a U-shaped colonial structure doubling the hospital's capacity, making a total of fifty beds, with two operating rooms.

There is a department for Nurses and the Sisters of Mercy have charge of the institution. There are also X-ray and Laboratory departments in full operation.

Archbishop Shaw granted special permission to Dr. Wilton P. Tilly for the Sisters of Mercy to take charge of the Infirm-

ary. Two graduate Nurses of the Order have taken charge of the operating department. It is the hope of the Infirmary that it will soon establish a training school for Nurses. The hospital maintains a house physician and auto ambulance service.

THE MEDICAL ASSOCIATION OF THE SOUTHWEST AND THE TRI-STATE SOCIETY will meet at Hot Springs, Ark., October 16-17-18. There will be three clinics which will be most profitable and well worth making the trip for.

Dr. W. T. Wootton, of Hot Springs, chairman of the general committee, announces that the mornings will be given over to clinics, the afternoons to scientific papers and the evenings to get-together meetings of the various college alumni and the usual social features. The Eastman Hotel will be headquarters, registration, exhibits and sessions will all be held under one roof.

The clinics will be conducted by authorities of nation-wide fame, and this meeting, if the plans of the committee carry, will no doubt go down in the history of each society as its most successful meeting. Clinics will be held on:

The Heart and Blood Vessels; Kidney Diseases; Neuro-Syphilis; Arthritis, and Forms of Joint Infections.

Dr. St. Cloud Cooper, of Fort Smith, Ark., is president of the Southwest Association and Dr. Charles A. Smith, of Texarkana, Ark., is president of the Tri-State Society.

THE AMERICAN PROCTOLOGIC SOCIETY held its twenty-third annual meeting in May. A preliminary meeting by invitation was first conducted at the Mayo Clinic, May 19 and 20. On May 22 and 23 the regular scientific sessions were held in St. Louis. The following officers were elected: President, Emmet H. Terrell, Richmond, Va.; Vice-President, William H. Kiger, Los Angeles, Cal.; Secretary-Treasurer Ralph W. Jackson, Fall River, Mass.

THE ROCKEFELLER FOUNDATION announces the prompt suppression of a yellow fever epidemic on the Pacific coast of South America, by means of fish. In malaria control as well as in operations against yellow fever, fish are now playing a most important roll. Richmond, Va., has stocked all its fountains, reservoirs and lakes with top minnows and the city maintains

hatcheries to furnish fish free of charge to the communities of the State.

Drs. Fortier and Gately announce the opening of a new department at Hotel Dieu for deep X-ray therapy. The department is equipped with a Victor apparatus.

Touro Infirmary has two vacancies for internes. Information as to salary and other details are obtainable from the superintendent.

At the Charity Hospital, New Orleans. A record number of patients passed through the Accident Room, there being 2024 cases handled in the month. This service is run by five internes, of which, at the present time, two are women. In the clinic an average of 545½ patients were treated daily. This is the highest daily average ever reached in the clinic. On July 31st there were 743 patients in the clinic. The daily average of patients in the wards was 990.

Bids for the erection of the new addition to the clinic were received and opened on August 7th. The expectation is that work will start on this building some time in the near future. The contract was awarded to R. P. Farnsworth, whose bid was $70,140.00. The clinic will be completed in six months.

A Physiotherapy Department has been installed in Charity Hospital under the direction of Miss Marion H. Bentley. Miss Bentley is a graduate of the Sargent School of Physical Education, Boston. Her practical training was received at the Massachusetts General Hospital in Boston, and the Mayo Clinic.

Lectures to the intermediate class of nurses were begun on May 1st. Each nurse is given practical work in the Physiotherapy Room. One nurse is given this training every month. The practical work of the Physiotherapy Department was started on June 15th. Heliotherapy massage, exercise for post-operative cases, and detailed exercise for faulty posture and lateral curvature are given in this department.

Removals: Dr. G. R. Carroll, from Cravene to Fullerton, La.
Dr. J. D. Gladney, from Homer, La., to Albuquerque, N. M.
Dr. W. C. Hart, from Summit, Miss., to McComb, Miss.
Dr. J. E. Lawton, from Timberton, La., to Baton Rouge, La.

BOOK REVIEWS AND NOTICES.

The Principles of Immunology, by Karsner and Ecker. J. P. Lippincott & Company, Philadelphia and London.

This is the best work on the subject that has come to the notice of the reviewer. The authors are to be congratulated upon an excellent and concise review of their subject, fully up-to-date. The book will be of great value to all students of a subject, whose importance cannot be overestimated to the modern scientific physician.

It is perhaps too advanced for general use by students. The chapter on agglutinins and precipitins is particularly strong.

C. J.

Essentials of Laboratory Diagnosis, by Francis Ashley Faught, M. D. Seventh revised and enlarged edition.

In the seventh edition of this well-known work, the author has brought it fairly up-to-date by practically rewriting the book. It is an excellent text book for workers in the Clinical Laboratory. It would be better perhaps if the subject of Blood Pressure was not contained in a work of this kind, as Blood Pressure takings have become such a common procedure in the office and at the bedside, that they can no longer be considered laboratory procedures. Blood Chemistry is given several chapters, but the subject is so broad that more space might be advantageously awarded to it. The well-known and valuable carbolic acid test for Globulins in the cerebro-spinal fluid is omitted, which the reviewer feels is a mistake. We are glad to see that so eminent an authority as Dr. Faught regards the Bass-Watkins reaction of value in the diagnosis of Typhoid Fever. On the whole the book is to be recommended, especially to students. C. J.

PUBLICATIONS RECEIVED.

THE MACMILLAN COMPANY, New York.

X-Ray Dosage in Treatment and Radiography, by William Daniel Witherbee, M. D., and John Remer, M. D.

Food, Health and Growth, by L. Emmett Holt, M. D., Sc. D., LL. D.

J. B. LIPPINCOTT COMPANY,' Philadelphia and London.

Endocrine Glands and The Sympathetic System, by F. Lereboullet, H. Carrion, A. G. Guillaume, translated by F. Raoul Mason, M. D., assisted by Daniel R. Ayres, A. B., M. D.

C. V. MOSBY COMPANY, St. Louis.

Diseases of the Thyroid Gland, by Arthur E. Hertzler, M. D., F. A. C. S.

WASHINGTON GOV'T. PRINTING OFFICE, Washington, D. C.

United States Naval Medical Bulletin, Vol. 17, No. 1, July, 1922.

Public Health Bulletin No. 123, (Transactions of the Second Annual Conference of State Sanitary Engineers.)

Public Health Reports, Vol. 37, Nos. 28, 29, 30.

REPRINTS.

Avulsion of the Scalp. Review of the Literature and the report of a case, by Chas. A. Porter, M. D., and Wm. M. Shedden, M. D.; **Epidemic Control in Europe and the League of Nations,** by Wickliffe Rose; **What is Cancer and How It Should Be Treated,** by L. Duncan Bulkley, A. M., M. D.; **Report of Commissioner of Military Records, A. B. Booth, to the Governor of the State of Louisiana, May, 1922.**

MORTUARY REPORT OF NEW ORLEANS.

Computed from the Monthly Report of the Board of Health of the City of New Orleans, for July, 1922.

CAUSE	White	Colored	Total
Typhoid Fever	4	1	5
Intermittent Fever (Malarial Cachexia)			
Smallpox			
Measles			
Scarlet Fever			
Whooping Cough	1		1
Diphtheria and Croup	1		1
Influenza	1		1
Cholera Nostras			
Pyemia and Septicemia	2		2
Tuberculosis	38	30	68
Cancer	31	9	40
Rheumatism and Gout			
Diabetes	6	2	8
Alcoholism	2	1	3
Encephalitis and Meningitis	0	1	1
Simple Peritonitis	1	1	2
Locomotor Ataxia	20	12	32
Congestion, Hemorrhage and Softening of Brain	1	3	4
Paralysis	1		1
Convulsions of Infancy			
Other Diseases of Infancy		1	1
Tetanus	1		1
Other Nervous Diseases	52	32	84
Heart Diseases	2		2
Bronchitis	12	13	25
Pneumonia and Broncho-Pneumonia	1	1	2
Other Respiratory Diseases	2		2
Ulcer of Stomach	1	1	2
Other Diseases of the Stomach	13	6	19
Diarrhea, Dysentery and Enteritis	6	2	8
Hernia, Intestinal Obstruction	3	3	6
Cirrhosis of Liver	2	3	5
Other Diseases of the Liver			
Appendicitis	13	3	16
Bright's Disease	22	13	35
Other Genito-Urinary Diseases	5	5	10
Puerperal Diseases	7	2	9
Senile Debility	1		1
Suicide	1	1	2
Injuries	18	6	24
All Other Causes	79	57	136
Total	350	209	559

Still-born Children—White, 20; colored, 24; total, 44.

Population of City (estimated)—White, 295,000; colored, 110,000; total, 405,000.

Death rate per 1000 per annum for month—White, 14.23; colored, 22.80; total, 16.58. Non-residents excluded, 14.19.

METEOROLOGIC SUMMARY (U. S. Weather Bureau).

Mean atmospheric pressure	30.66
Mean temperature	82.
Total precipitation	4.05 inches

Prevailing direction of wind, southwest.